THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE — NOVEMBER, 1943

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DETROIT

ECHNOLOGY DEPT!

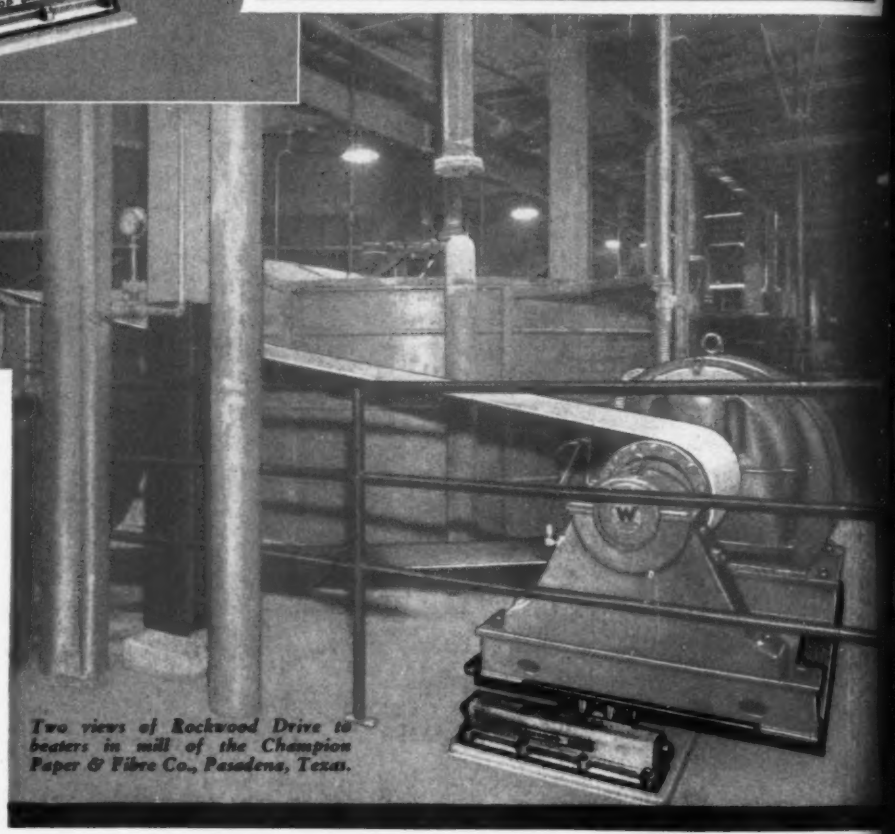
APER OVERCOAT" FOR "BIG INCH"

"Big Inch" Oil Pipeline which runs 1475 miles from the wells in Texas to the refineries near New York and adelphia is wrapped with asbestos paper. This "Winter Overcoat" provides insulation that will help "keep oil ving" when the weather gets bitter cold. Arrow in the photograph points to the roll of asbestos paper on the hine which rotates and spirals it around the pipeline. . . . We don't know who made the asbestos paper shown is photograph, but we do know that with the aid of Downingtown Machinery, asbestos paper is made by our omers, Philip Carey Mfg. Co., Johns-Manville Corp., Keasbey & Mattison Co., Norristown Magnesia & Asbestos Co., eroid Co., and U. S. Gypsum Co. . . . Performance of Downingtown Machinery under the stress of wartime ditions is something for every paper and board mill to remember, or investigate, before ordering post-war ipment. . . . Our Engineering Dept. is at your service, NOW. . . . Downingtown Mfg. Co., Downingtown, Pa.

DOWNINGTOWN

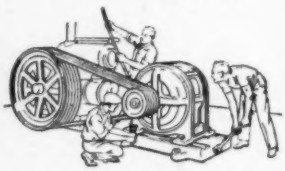
nformation—Photo by Vachon

ROCKWOOD
automatic belt tightening
MOTOR BASES



Two views of Rockwood Drive to beaters in mill of the Champion Paper & Fibre Co., Pasadena, Texas.

DO AWAY WITH THIS



Costly shut downs for manual belt tightening are a thing of the past —too wasteful of time and labor. Thanks to the Rockwood pivoted motor base, belt tightening is now made automatic. Belts that stretch are automatically re-tightened— and made neither too tight nor too loose, but just right to suit varying loads. Rockwood bases are the biggest improvement ever developed for electric motor belt drives. Use with either V-belts or flat belts.

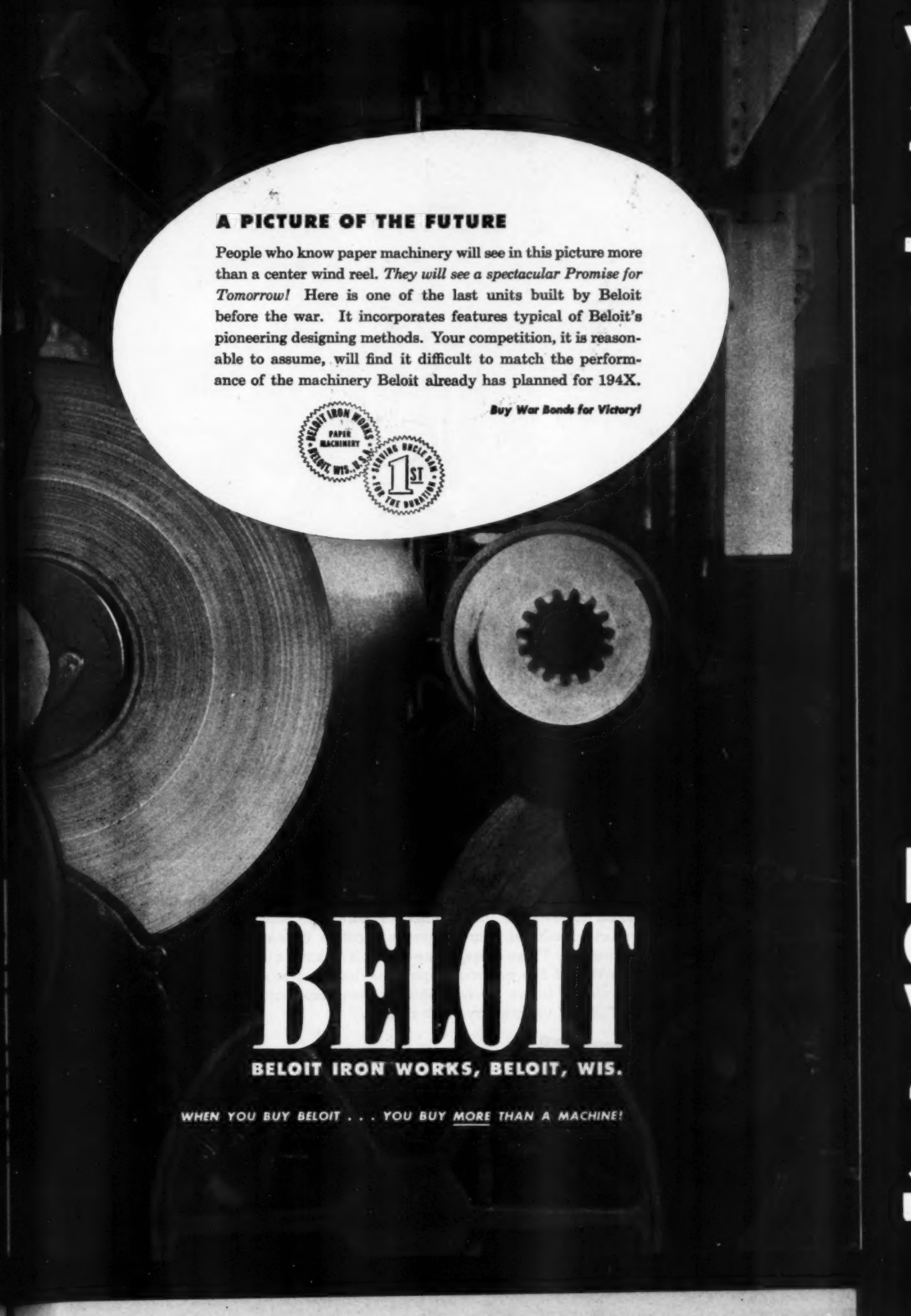
AUTOMATIC BELT TIGHTENING
IMPROVES MOTOR BELT DRIVES

In almost every paper mill where one or more Rockwood Drives are first installed on trial and plant engineers then take time to carefully check results, the automatic belt tightening motor base soon becomes accepted mill practice.

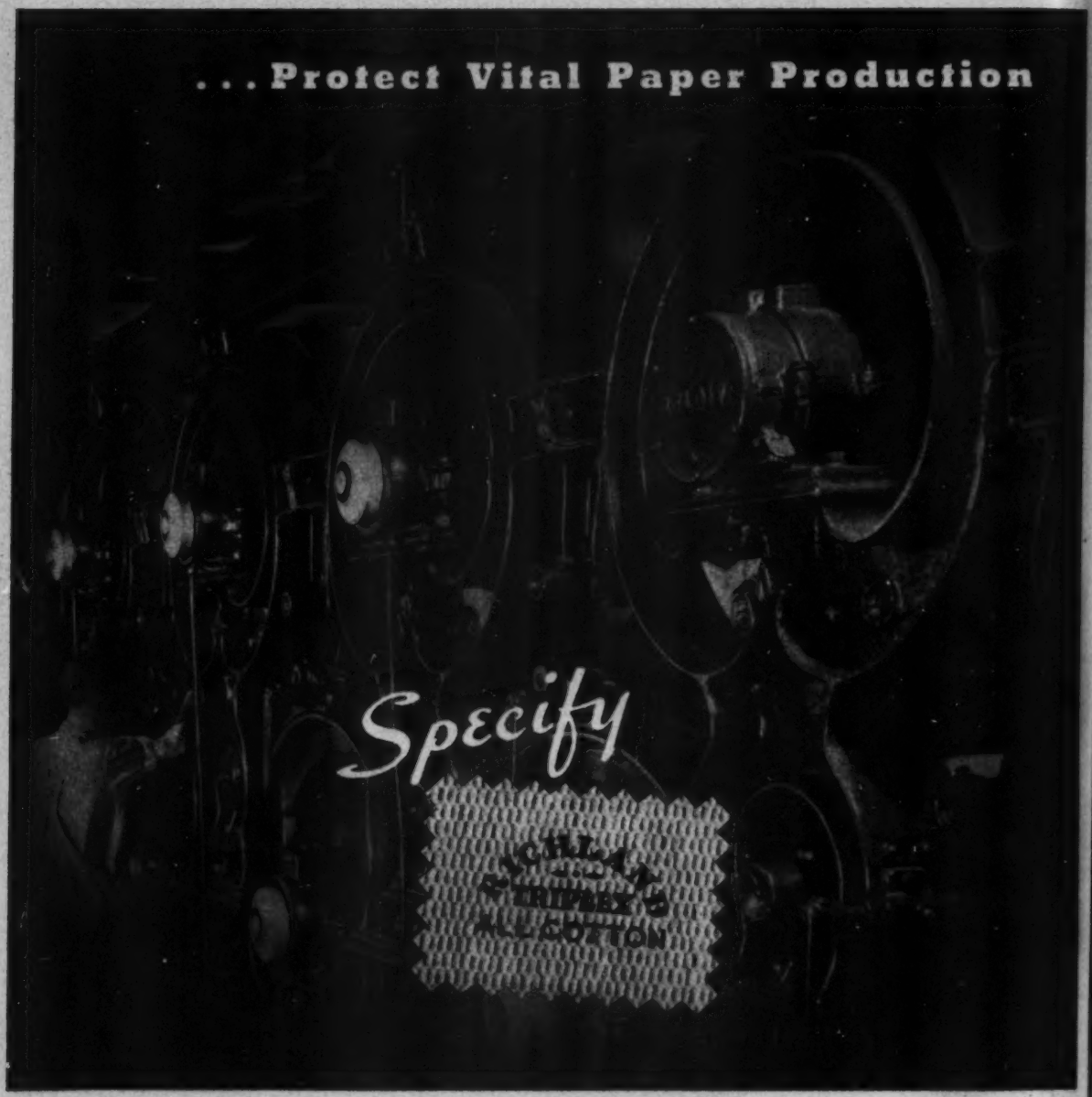
When mill engineers see how simply the Rockwood pivoted motor Drive takes up belt stretch, and how the belt tightness automatically matches each load cha it is obvious why the driven machine operates b and at more dependable speeds.

Belt life — V-belt or flat—is increased, *ordin doubled*. Never before has a belt drive from ele motor to driven machine been so soundly engine that is the reason so many paper mill engineers installing them. *Write us about your d today for better mill operation tomor*

ROCKWOOD
INDIANAPOLIS • U.S.A.
Specialists in Power Transmission Equipment Since 1884


A PICTURE OF THE FUTURE
People who know paper machinery will see in this picture more than a center wind reel. They will see a spectacular Promise for Tomorrow! Here is one of the last units built by Beloit before the war. It incorporates features typical of Beloit's pioneering designing methods. Your competition, it is reasonable to assume, will find it difficult to match the performance of the machinery Beloit already has planned for 194X.
Buy War Bonds for Victory!
BELOIT IRON WORKS
PAPER MACHINERY
BELOIT WIS. U.S.A.
SERVING UNCLE SAM
1ST
FOR THE DURATION
BELOIT
BELOIT IRON WORKS, BELOIT, WIS.
WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

. . . Protect Vital Paper Production



To have served so many leading paper mills, manufacturing the finest of paper for over half a century is an achievement that justifies the care with which RICHLAND TRIPLEX All-Cotton Dryer Felts are made. Produced from top-grades of cotton, their strong sturdy yarns make them long-wearing and economical. These heavy duty dryer felts have a smooth, uniform contact surface so essential to the making of fine qualities in paper. A high degree of porosity with a minimum amount of shrinkage and stretch insure smooth efficient operation. Protect today's vital paper production with RICHLAND TRIPLEX uniform dryer felt quality.

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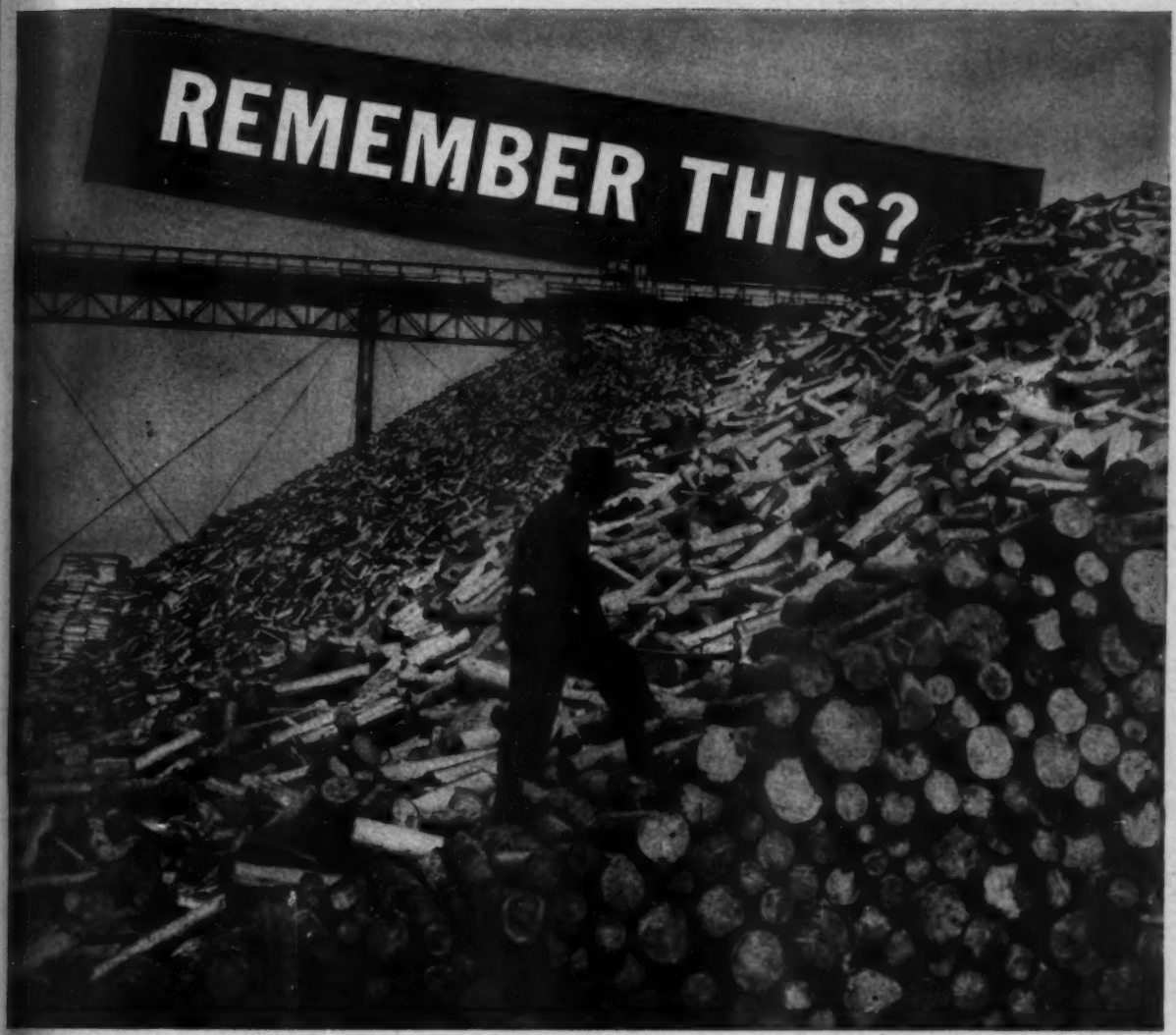

MANPOWER shortage is curtailing pulpwood production and threatens a further cut in newsprint and other paper. This situation makes mandatory the curtailment of paper breakage and stock re-work.

In striving for higher efficiency and continuous operation, paper mills everywhere are finding *Texaco Lubricants* a very welcome help.

Texaco Ursa Oil in the circulating systems of driers and calenders assures normal bearing temperatures under all operating conditions, by supplying clean cool oil to each bearing. Uniformly easy to filter or reclaim, *Ursa Oil* is definitely preferred in many important paper mills.

A Texaco Lubrication Engineer is available to you through more than 2300 Texaco distributing points in the 48 States.

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

**More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.*

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**More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.*

**More revenue airline miles in the U. S. are flown with Texaco than with any other brand.*

**More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.*

TEXACO

TEXACO Lubricants

FOR THE PAPER INDUSTRY

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

Ernie Pyle, *FAMED WAR CORRESPONDENT,* finds pure water vital to our fighting men

ERNIE PYLE, FAMED SCRIPPS-HOWARD WAR CORRESPONDENT

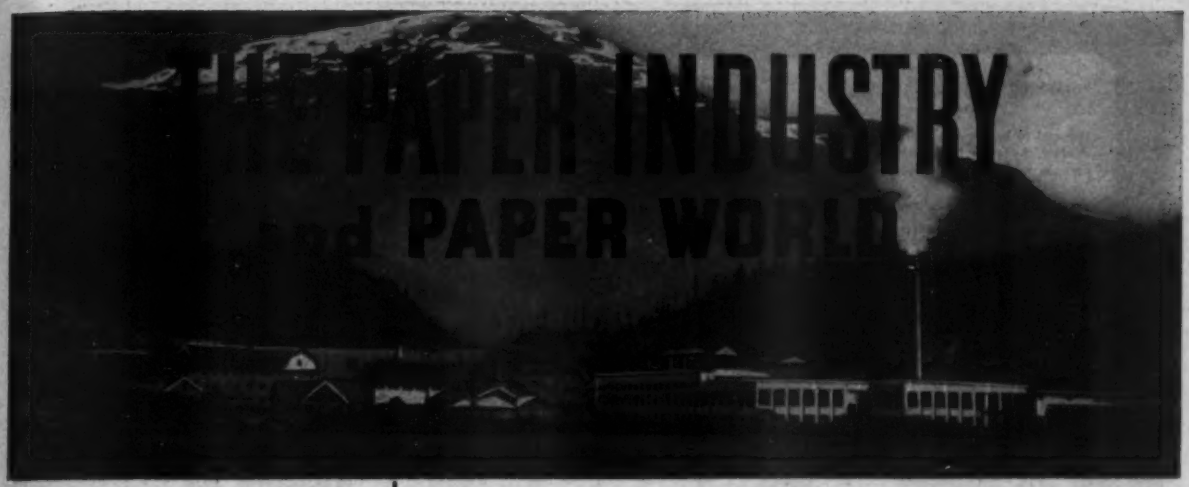
". . . you could almost say an army marches on its water," wrote Ernie Pyle in a recent dispatch from the Mediterranean front. "When a water point is found, the engineers wheel in their portable purifying unit. This consists of a motorized pump, and sand filter, chlorinating machine and a collapsible 3,000-gallon canvas tank. The chlorine we inject comes in powder form in 1 gallon cans—we usually use 1 part of chlorine to a million parts of water. The engineers of the 45th Division brought with them enough chlorine to last 6 months. In addition to chlorine, alum and soda ash are injected into the water."

THAT "chlorine in powder form" which Ernie Pyle speaks of is, of course, high test calcium hypochlorite, and, as likely as not, it's Mathieson HTH. That soda ash, too, is probably fused soda ash in tablet form made by Mathieson especially for use by our armed forces overseas.

Not as spectacular but just as important a war job is being done on the production front by other Mathieson Chemicals—caustic soda, soda ash, liquid chlorine, ammonia, sodium chlorite, sodium methylate, magnesium metal, liquid and solid carbon dioxide. These products are vital raw materials in nearly every phase of American war production, including ships, planes, tanks, guns, gasoline, clothing, food, medical supplies and many other materials which will go to make up final victory for the United Nations.

Mathieson CHEMICALS

THE MATHIESON ALKALI WORKS (Inc.) 60 EAST 42nd STREET, NEW YORK, N. Y.



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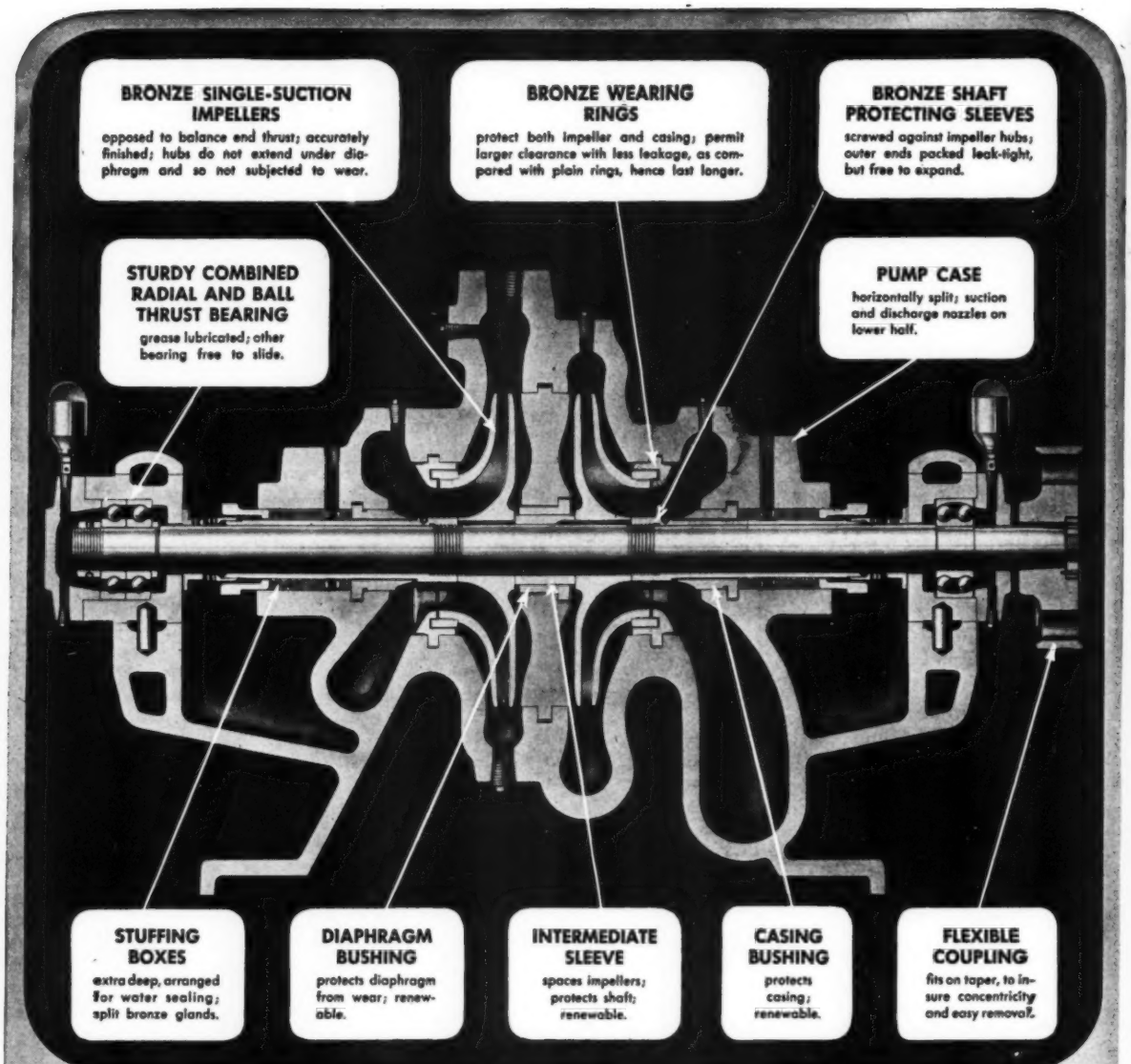
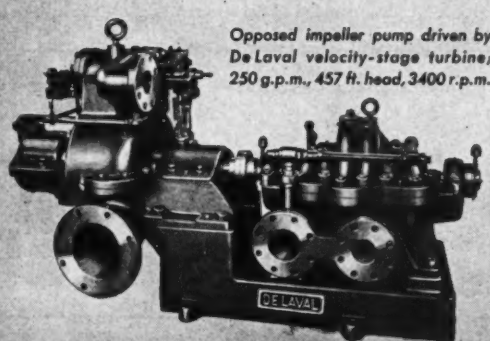

BRONZE SINGLE-SUCTION IMPELLERS
opposed to balance end thrust; accurately finished; hubs do not extend under diaphragm and so not subjected to wear.
BRONZE WEARING RINGS
protect both impeller and casing; permit larger clearance with less leakage, as compared with plain rings, hence last longer.
BRONZE SHAFT PROTECTING SLEEVES
screwed against impeller hubs; outer ends packed leak-tight, but free to expand.
STURDY COMBINED RADIAL AND BALL THRUST BEARING
grease lubricated; other bearing free to slide.
PUMP CASE
horizontally split; suction and discharge nozzles on lower half.
STUFFING BOXES
extra deep, arranged for water sealing; split bronze glands.
DIAPHRAGM BUSHING
protects diaphragm from wear; renewable.
INTERMEDIATE SLEEVE
spaces impellers; protects shaft; renewable.
CASING BUSHING
protects casing; renewable.
FLEXIBLE COUPLING
fits on taper, to insure concentricity and easy removal.

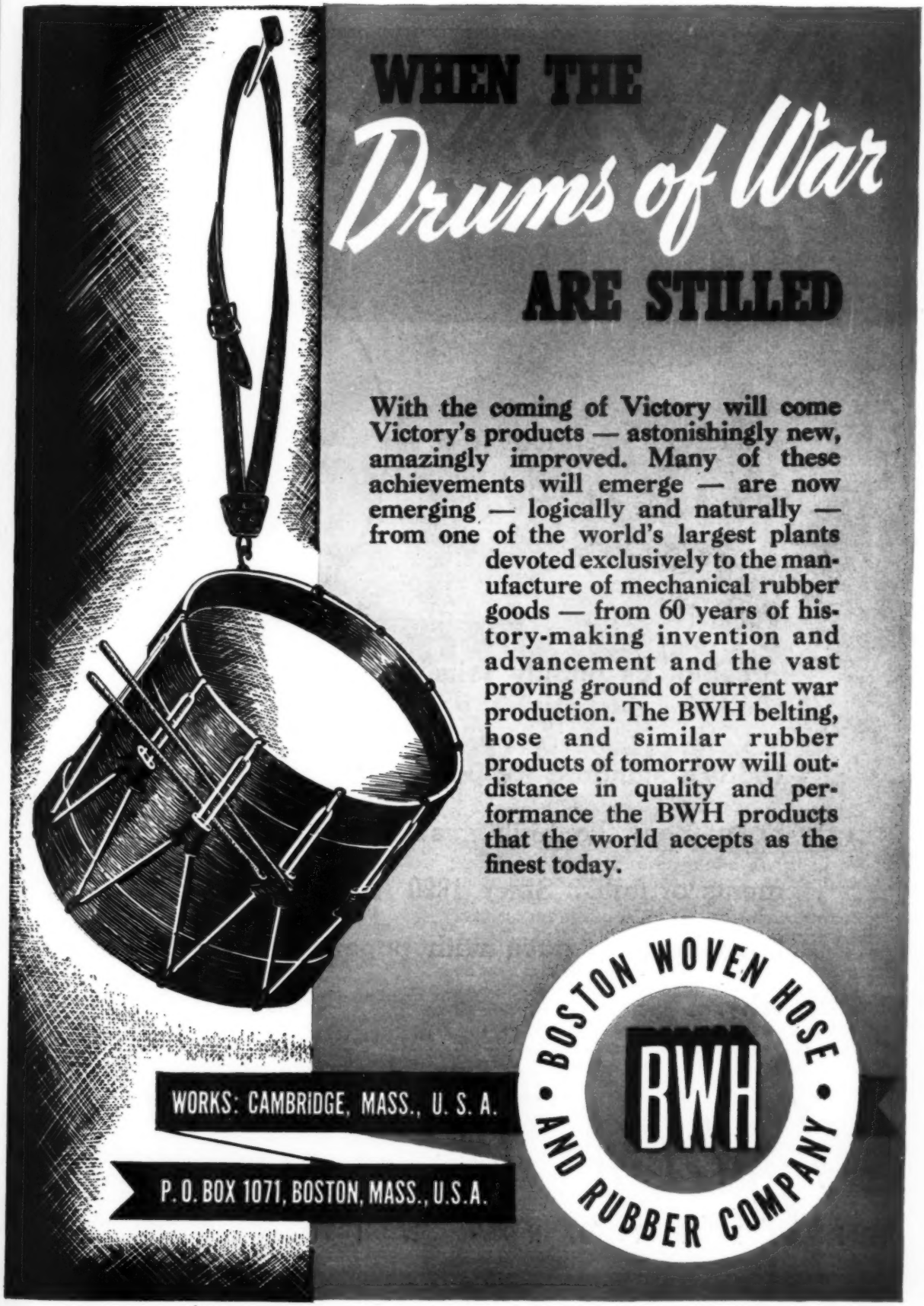
DE LAVAL *OPPOSED* IMPELLER PUMP



Opposed impeller pump driven by De Laval velocity-stage turbine; 250 g.p.m., 457 ft. head, 3400 r.p.m.

In this pump the two single-suction impellers have their suction inlets facing outwardly, thus balancing the pump hydraulically and requiring only two pairs of wearing rings. High efficiency is thus combined with simple construction. Pumps built in capacities up to 1500 g.p.m. and for heads up to 800 ft. Ask for Catalog P-3226.

DE LAVAL STEAM TURBINE CO. . . TRENTON, N. J.


WHEN THE
Drums of War
ARE STILLED
With the coming of Victory will come Victory's products — astonishingly new, amazingly improved. Many of these achievements will emerge — are now emerging — logically and naturally — from one of the world's largest plants devoted exclusively to the manufacture of mechanical rubber goods — from 60 years of history-making invention and advancement and the vast proving ground of current war production. The BWH belting, hose and similar rubber products of tomorrow will outdistance in quality and performance the BWH products that the world accepts as the finest today.
BOSTON WOVEN HOSE AND RUBBER COMPANY
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WORKS: CAMBRIDGE, MASS., U. S. A.
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Appleton Felts

MAKE GOOD PAPER

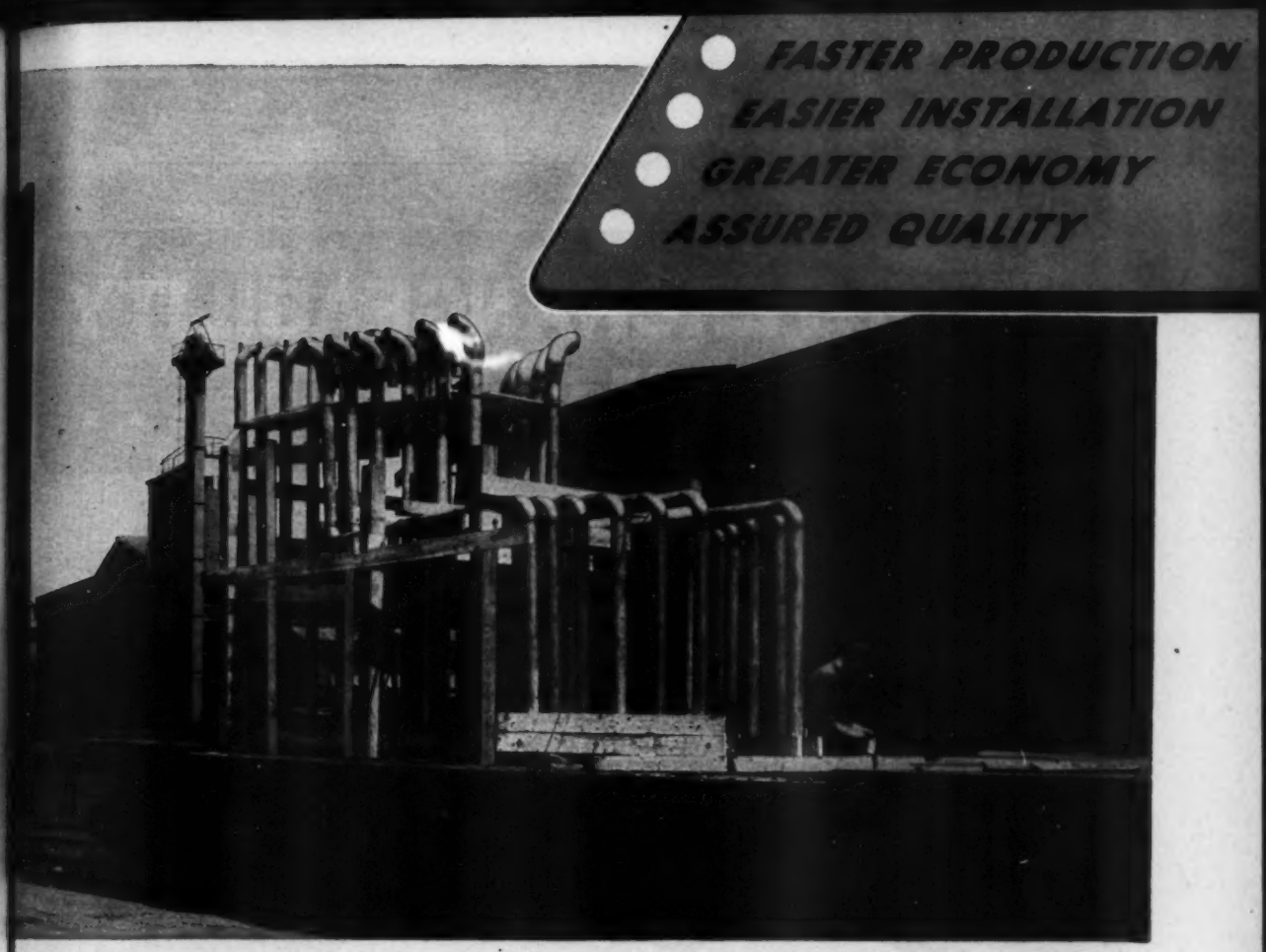
You'll get service, too, from Appleton Felts, that are designed and manufactured with technical foresight as quality felts.

Today's standard for paper mill felts, Appleton Felts meet the high speed production requirements of mills. Since 1890 Appleton Felts have been keeping pace with paper making—that's why.

BUY WAR BONDS

Appleton Woolen Mills

APPLETON • WISCONSIN



with PITTSBURGH PIPING AND EQUIPMENT COMPANY'S

PRE-FABRICATED PIPING

PRE-FABRICATING piping into subassemblies as large as shipping facilities and installation space will permit, saves time both in the shop and in the field. It assures uniform quality and utmost economy through unified control of all production operations.

The photograph above shows a subassembly of pre-fabricated stainless piping to be used in a synthetic rubber plant. Consisting of 570 feet of I.P.S. straight pipe and 108 pieces of standard I.P.S. welding reducers and welding elbows, the entire assembly is made of stainless steel number 347.

Pittsburgh Piping and Equipment Company has had over forty years successful experience in research, engineering and development in the fabrication of single units or complete piping systems for central stations, chemical and process plants, plus complete facilities for bending, welding, machining, heat treating, stress-relieving . . . experienced personnel for fabricating and erecting . . . a well equipped metallurgical laboratory to constantly check materials and operations during field erection as well as fabrication. Dimensional accuracy, uniform quality, and dependability, are thus assured in every type of piping installation.

Let our engineers help you plan improvements, additions, or complete new plants. Contact our nearest representative or write us direct. There is no obligation.

Back The Attack—Buy War Bonds

Pittsburgh Piping AND EQUIPMENT COMPANY

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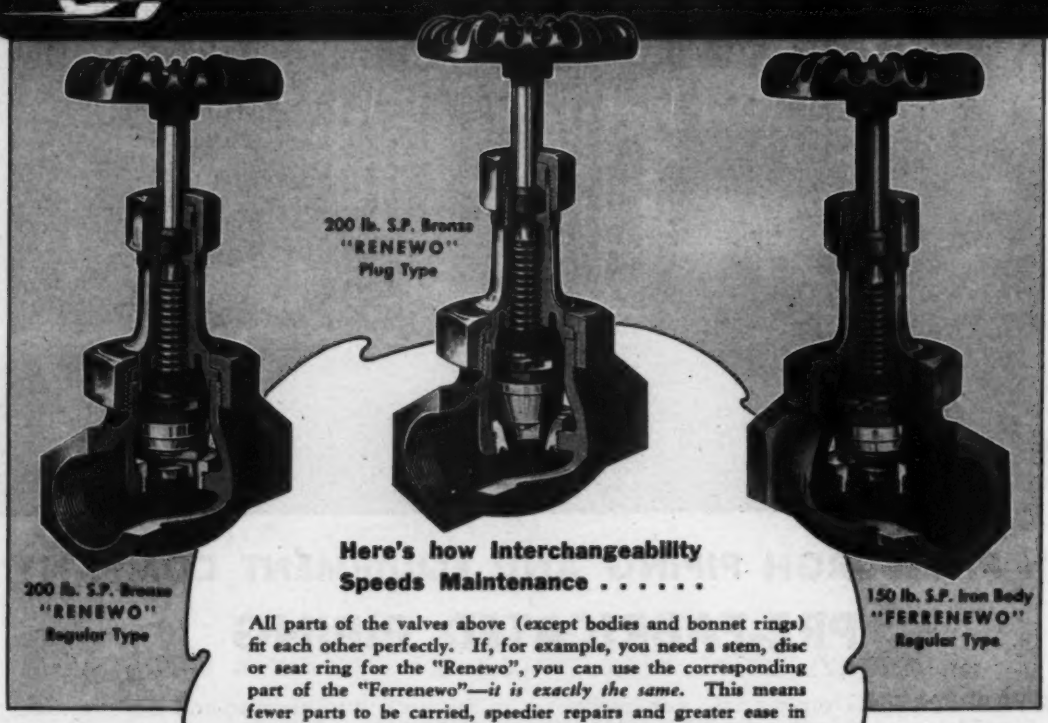
Simplicity of Design Means Easier Maintenance

INTERCHANGEABILITY Speeds Maintenance . . .



Here's how Interchangeability Speeds Maintenance . . . . . .

All parts of the valves above (except bodies and bonnet rings) fit each other perfectly. If, for example, you need a stem, disc or seat ring for the "Renewo", you can use the corresponding part of the "Ferrenewo"—*it is exactly the same.* This means fewer parts to be carried, speedier repairs and greater ease in making them. This flexible interchangeability likewise applies between the various 300 lb. S.P. "Renewo" Valves.

Never has proper valve maintenance been so essential as now. With the scarcity of new valves, it is all-important to take the best of care of those you have in service. The necessity for uninterrupted operation demands no less.

With regular checking and inspection of this vital equipment and prompt servicing when necessary, valve life can be lengthened materially. It may save costly repairs later, and the possible shut-down of equipment.

The simplicity of design of Lunkenheimer "Ferrenewo" — "Renewo" Valves, with interchangeable parts, makes them easy to keep in good operating condition—easy to maintain. It means speedier repairs with minimum expenditure for maintenance.

Use the complete facilities of Lunkenheimer distributors.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
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BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS. ASK FOR CATALOG 78

FORTY YEARS OF *Sincere Service* TO THE PAPER INDUSTRY!

FORTY YEARS . . . a long time! Much has happened in four decades; much has changed.

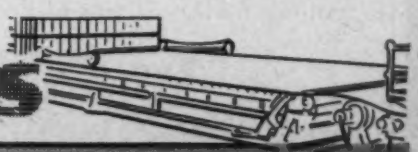
The importance of *quality* has not changed. Today, it is more paramount than ever. Year after year the quality of Fourdrinier wire cloth has improved in reference to mesh, seaming, selvedge, and the metal itself. Over-all, the width of Fourdrinier wires has nearly doubled to cope with new requirements as they arose, and special applications have been multiplied many-fold.

THE FIRST BUILDING . .

. . THE PLANT TODAY

Lindsay serves the paper industry exclusively. We have sought to contribute materially since 1903 to the progress of wire cloth manufacture and hence to the quality of paper. Forty years of such specialization necessarily create for us an obligation to do our part just a little better every day. Lindsay wire cloth will continue to uphold those ideals of excellence which were set for us by our founder.

THE
LINDSAY WIRE WEAVING COMPANY
Serving the Paper Industry Since 1903
14001-14299 ASPINWALL AVE. CLEVELAND 10, OHIO



Lindsay **WIRES**
FOR PAPER MILLS

Goodwill Is *NOT* Rationed

***A Report to the Forest Industries on the New "TOOLS" Available for Making Friends . . . and a Suggestion That* YOU USE THEM**

Twenty months ago AMERICAN FOREST PRODUCTS INDUSTRIES was given a task new to our industry. . . .

The job was to find the means of dispelling prejudice and misunderstanding about the forests, forest enterprise, and forest products. This undertaking is of great personal importance to everyone who works with wood . . . whether lumber, plywood, pulp and paper, shingles or wood plastics . . . whether stockholder, manufacturer, worker, distributor, or salesman.

Never before had such a substantial proportion of the forest industries banded together in a cause of such basic interest to the *one million workers who depend upon wood for their living.*

The most common-sense type of post-war planning for our industry may be the cementing of old friendships and the building of new ones through the simple process of truthfully explaining ourselves and our operation of America's only renewable natural resource.

We are getting on with the job . . . but it is now YOUR turn to help.

For months a staff of writers, radio, and motion picture people has been telling the fascinating story of our industry . . . but it will take a long time to reach one hundred and thirty million people. You will be pleasantly surprised to observe how eagerly the men and women in your own community will welcome goodwill information and how quickly understanding will improve.

Many hands hasten any job. Your AFPI staff can never duplicate the results which can be achieved by an explanation of forest facts in thousands of communities *by the citizens* of those communities. . . .

You are one of them . . . Will you help?

Let's All Get on the *TEAM!*

Making friends is often a job we must do ourselves, each in his own community. Understanding cannot be hired, borrowed, or bought over the counter. And yet, goodwill is *your* best bulwark against the future.

For our industry it consists of such things as freeing the public mind of groundless fears of a "timber famine" . . . of explaining how much wood grows in America each year . . . of informing the six out of ten people who believe wood outmoded that, actually, it is the most versatile of materials, sprouting exciting new uses like a June rose.

You'll need factual material to explain the "New Age of Wood" to your community. Your next step is to learn about the booklets, posters, charts, maps, motion pictures, speeches, newspaper stories, features, and advertising which are ready for you, *without cost.* Send for the little booklet illustrated below.

Will You . . .

. . . help the children in your town understand forest facts by asking your schools to use AFPI school books, posters and map?

•

. . . bring to your people the dramatic story of "Wood Goes to War", by urging your theatre to show this Technicolor picture by James A. Fitzpatrick?

•

. . . arrange to have your club enjoy the free movie, "Trees for Tomorrow."

•

. . . read, and pass on to others, interesting forest information in the "Quiz Book" on American forests . . . and use "Speak Up", valuable aid to speakers on forest industries?

•

. . . tell our story in your local newspaper by means of ready-to-use advertising, available to you without cost?

•

These and many other new implements of understanding are all illustrated in the catalog, "TOOLS". Send for it. Use the coupon.

Public Relations Department
American Forest Products Industries, Inc.
1319 - 18th St., N. W., Washington 6, D. C.

Please send your booklet *Tools for the Improvement of Forest Industry Public Relations* so that I may make the good will team and get the tools to win more friends for my industry.

Individual_____

Company_____

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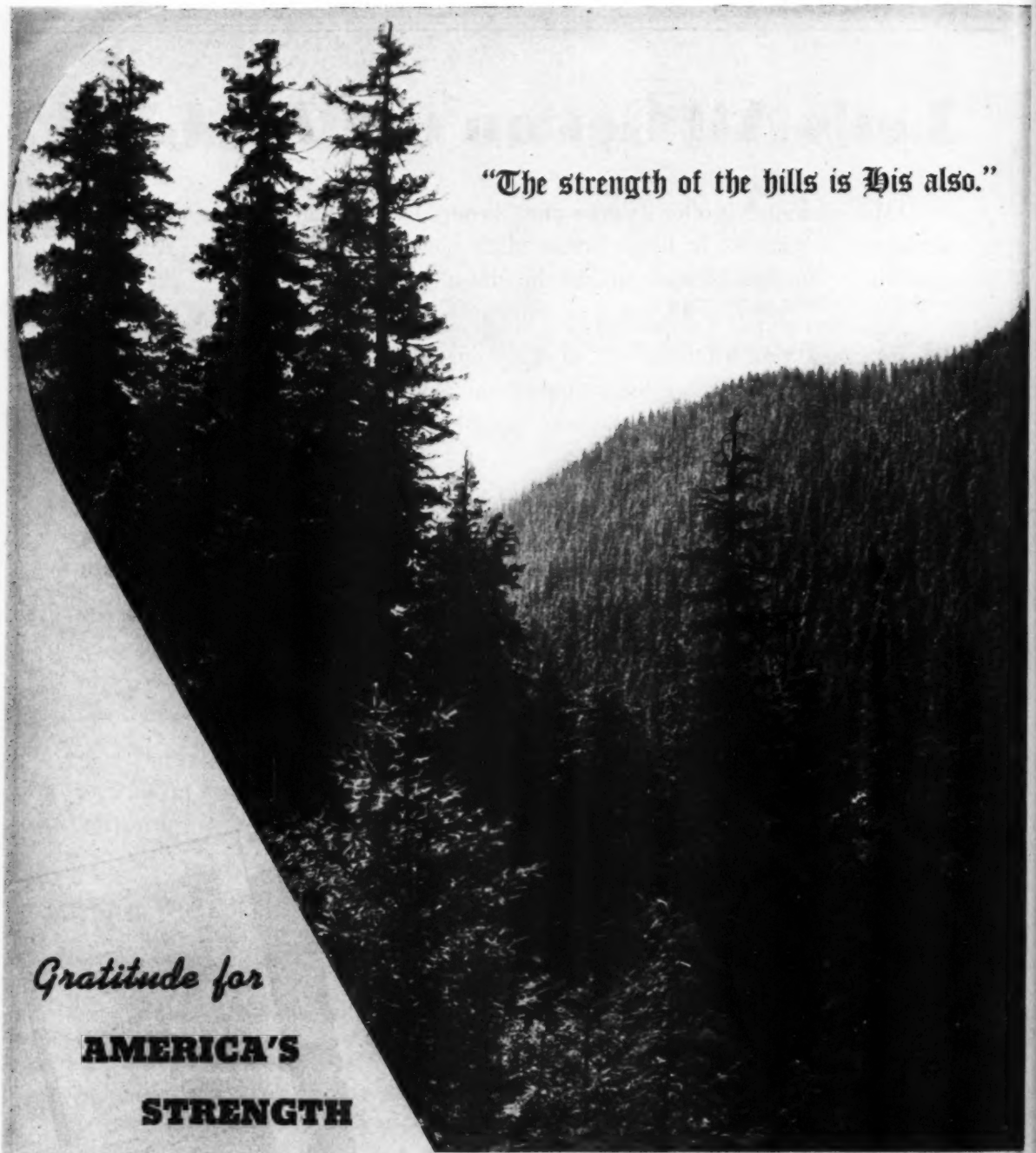

❧ Thanksgiving Day will be a special day this year. We may need to count our blessings more carefully than ever to bring out the fullest and truest expression of our gratitude.

❧ America's traditional Thanksgiving Day has been a day set apart to give thanks for the blessings we have received during the past year. This year many homes all over our Nation will feel the pinch of war and its sacrifices, and our gratitude must go very deep to find a firm foundation in the "Rock of Ages."

❧ Because the past year has given all of us cause to seek true values, we may be grateful for the study and meditation that has come from that understanding. But above the picture of war and its devastation, we are perhaps most grateful for the strength to defend our liberty and the knowledge that the same divine protection which watched over the pioneers who established this great country will bring America through its present conflict victorious. Through sacrifice we learn a deeper sense of gratitude. Then let us be grateful for a true understanding of the source of our Nation's strength, for its unity, and for plenty.

TRADE WINDS

War Economy and the Pulp and Paper Industry

E. W. Tinker, executive secretary of the American Paper and Pulp Association, sent the following release to paper and pulp manufacturers on October 19, following the realignment of the former Commodities Bureau and the WPB's official announcement on October 16 of the new Forest Products Bureau.

▶▶▶ SPECIFIC STEPS that have been taken in Washington, as well as trends that are apparent, have a definite bearing upon the position of the pulp and paper industry under the war economy, at least for the remainder of the year.

The reorganization of the War Production Board as related to paper and allied industries was, beyond question, brought about by recognition of deficiencies in the previous organizational structure. The establishment of four specific branches and the delegation of responsibility for the functioning of these branches to qualified individuals, gives reason to hope that action will be expedited. The established divisions cover paperboard, paper, pulp allocation and pulpwood and pulp production. It is too early to determine whether or not a program, looking to increased production, rather than one of restriction, will be adopted. However, there is every evidence that public pressure, as evidenced by the attitude of Congress, has brought a desire to prevent one more major critical shortage problem as related to a major industry.

The hearings currently being held before the Boren Committee of the House of Representatives have emphasized and re-emphasized the bottleneck created by pulp shortages. In discussing the hearings with individual members of the Committee, no doubt is left that this Committee at least believes that immediate steps must be taken to assure an adequate supply of pulpwood and consequently of pulp. Whether the Committee will be able to obtain immediate and effective action remains to be seen.

Reaching far beyond the immediate problem of the industry are trends that are of grave concern in relation to postwar welfare. The preliminary report of the combined pulp and paper committee, representing the United States, Canada and the United Kingdom, places the problems of the three countries in one category in as far as production is concerned. In fact, under the war emergency the two countries, United States and Canada, are considered practically as a unit from a distribution standpoint. Closely related to this situation is the position of the Boren Committee, whose primary interest lies with newsprint, and which has been giving consideration to the recommendations of the newspaper publishers that standard newsprint be based upon less than the present 32-pound basis weight. Discussions before this Committee indicated thinking that might result in a serious upset of the current tariff structure that has for years been necessary to enable the domestic industry to survive.

As has repeatedly been pointed out by the American Paper and Pulp Association, there is one simple and easily obtained solution to our present problems, which involve not only the welfare of the industry but the public welfare as well. Sufficient pulp must be produced to supply the industry which, if operated at capacity, could meet all requirements. Every effort is being made to accomplish this end, through an action problem that will result in sufficient production of pulpwood in the different regions to permit the operation of available digester capacity. Specifically, War Manpower Commission officials have agreed to meet with mill representatives to develop an action program that will place adequate woods labor in the woods if this is possible. If it is not possible, then we will be assured that the facts pertaining to the situation have been considered.

Forest Products Bureau Replaces Pulp and Paper Division

▶▶▶ A COMPLETE REORGANIZATION of the War Production Board's divisions handling lumber, wood pulp, paper and paper products was announced officially on October 16.

Under the new setup, The Commodities Bureau has been redesignated *The Forest Products Bureau.* Transferred to this new bureau is The Lumber and Lumber Products Division which was formerly part of The Construction and Utilities Bureau. J. Philip Boyd is director of this division. This shift is being made to establish a closer co-ordination of the production of pulpwood with other forest products.

The new bureau forms part of a broad WPB program for increasing the production of wood pulp, paper, and paper products, and controlling distribution for essential purposes.

Director of the new bureau is Harold Boeschenstein. His assistant is Arthur G. Wakeman, who was director of the former Pulp and Paper Division. This division has now been divided into the following divisions as a part of the new Forest Products Bureau:

Pulp Production—Director, A. G. Hansen, formerly deputy director of the Pulp and Paper Division.

Pulp Allocation — Director, David Graham, formerly chief of the Fibrous Materials Section of the Pulp and Paper Division. This division's function will include maintenance records and statistics on pulpwood and pulp production, and paper stocks. →

Paper—Director, Rex Hovey, on leave as executive vice president of the Oxford Paper Company, New York. This division will handle all paper and converted paper products.

Paperboard—Director, G. G. Otto, on leave as vice president of the Alton Box Board Company (Alton, Ill.). This division will handle problems concerning kraft paperboard and boxboard, solid fiber containers, corrugated board containers, and folding and set-up boxes. This division also takes over kraft, jute, and all other types of container and boxboards, as well as paperboard cartons and boxes previously handled by the Containers Division.

E. F. Tomiska continues to head the *Containers Division,* handling all types of containers except those transferred to the Containers Division under G. G. Otto. The Containers Division (other than paper) is now a part of the Forest Products Bureau.

The Printing and Publishing Division will continue under Harry M. Bitner as part of the new bureau.

◆

POSTWAR PROBLEMS FOR PAPER EXPORTERS

Importance of immediate drafting of postwar plans by paper exporters in order to maintain prewar export markets was stressed at a paper and paper products session held October 27 in New York in conjunction with the 30th annual conference of the National Foreign Trade Council.

Adoption of uniform trade practices similar to those which have been employed by Germany and the Scandinavian countries for many years prior to the war was urged by Frank W. Smith, vice president of the National Paper & Type Company, as the first step toward concerted and co-operative action on the part of paper export merchants.

Emphasizing the necessity of preserving established channels of trade, Smith warned against the difficulties which might be encountered in direct export ventures by domestic manufacturing and converting interests unfamiliar with foreign trading practices.

"Paper mills in a certain neutral country are, even now, booking paper orders to be confirmed after the war," he said.

Postwar problems confronting United States paper exporters were summarized by Smith as including:

1) Strong competition from Scandinavian paper producing countries.

2) Intensive efforts by Canada to export her paper directly from mills instead of through American export houses, as formerly.

3) Little or no opportunity for American paper exporters to sell their products to member countries of the British Empire.

4) Probable tendency that some American paper mills will seek larger tonnage export business on a direct basis.

5) Increased local paper manufacturing facilities throughout Latin America, particularly in Brazil, Mexico and Argentina.

Greater emphasis on services and specialty business was recommended by Smith to combat these conditions.

With the aim of co-operating with exporters in reclaiming prewar markets, E. G. Lagerloef of the pulp and paper unit of the Bureau of Foreign and Domestic Commerce, submitted for trade suggestions a rough draft of a questionnaire which, it was announced, would be sent to United States consular offices in twenty Latin American republics. It was explained the questionnaire would seek to ascertain developments which have taken place in the individual countries during the War, specific details on marketing procedure and practices, and possible Latin American uses for new types of paper manufactured in the United States.

Replying to exporters' complaints that the "ridiculously small" quantities of products permitted by some import recommendations were far below the minimum quantities economically feasible which could be shipped individually, Rene A. May of the country program branch of the Office of Exports, under the newly consolidated Foreign Economic Administration, suggested that exporters ask their Latin American customers to place orders for needs as much as six months in advance. This, he explained, would enable exporters to ship fairly sizeable quantities under the quota permitted.

Presiding over the session was Eli de Vries of Parsons & Whittemore, Inc.

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Late News Flashes!

Nov. 1—Officials report that the WPB has decided against ordering additional reductions in the use of newsprint by American newspapers at this time. However, sharp cuts were predicted for 1944.

The WPB is expected to issue an order within the next day or two, accepting the recommendation of the Newspaper Industry Advisory Committee which will permit newspaper publishers to dip into their newsprint inventories to meet the 16 per cent deficit in current newsprint output. A cumulative cut of 10 per cent is now in effect—two orders, each for a 5 per cent cut, already have become operative; the first for the third quarter, the second for the fourth quarter of 1943.

Nov. 3—Featured in late news from the Forest Products Laboratory, Madison, Wisconsin, is the announcement of a new product, "papreg." This is a plastic made from thin paper sheets impregnated with resin which can be molded in two planes. Details have not been released by the Government.

Nov. 3—Recent experiments with de-inking processes at the New York State College of Forestry, Syracuse, New York, have been so satisfactory that a demonstration of the reprocessed paper will be made very soon on the presses at the *New York Daily News,* which has been working closely with *The Chicago Tribune* and its subsidiary, the Ontario Paper Company.

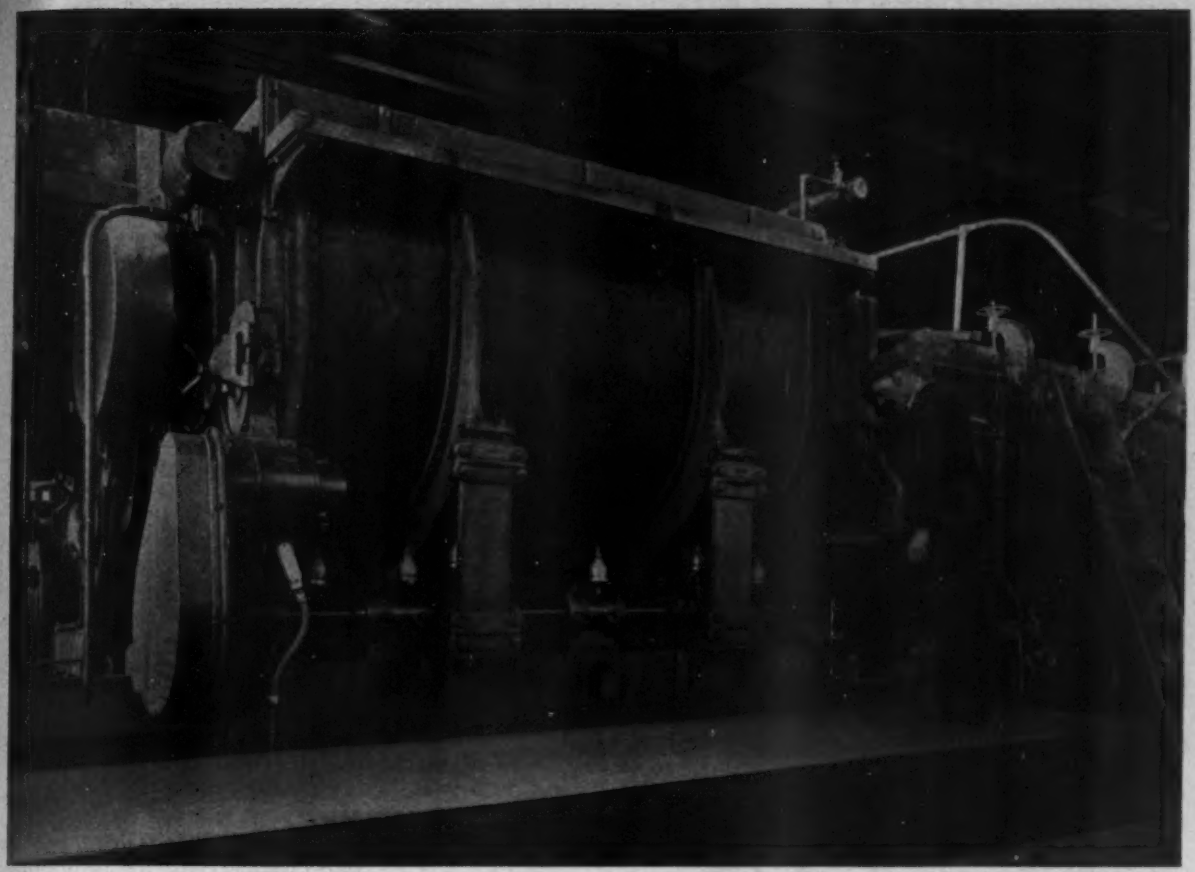
HEADQUARTERS OF CED MOVED TO NEW YORK

National headquarters of the Committee for Economic Development, principal postwar planning agency of American business, was moved to New York City from Washington, D. C., on November 1.

With Rueben B. Robertson, executive vice president of the Champion Paper and Fibre Company (Hamilton, Ohio), and Thomas B. McCabe, president of Scott Paper Company (Chester, Pennsylvania), included in its leadership, the committee is an independent, nonpolitical corporation organized by American businessmen to promote high levels of employment and production by private business enterprise after the War.

The committee has taken 3,000 square feet of space on the 22nd floor at No. 285 Madison Avenue, New York City, and 20 to 25 employees will be transferred from Washington to the New York headquarters. However, a research staff will remain at the committee's offices in the Department of Commerce Building, Washington, because it is necessary to maintain a close contact with official sources of information.

John F. Fennelly, former director of the War Production Board Program Bureau, will divide his time between Washington and New York, but E. Scott Fletcher, director of the Committee's field development division, will be established regularly in the New York office.



Now, OF ALL TIMES

KEEP YOUR BIRD SCREENS 100% EFFECTIVE

Rightly used and maintained your Bird Screens perform a more valuable service than ever, with stock as dirty as it is today. It's to your advantage to keep them in the best possible shape . . . If there's the slightest question about the way they're doing the job or whether they can do it better, get in touch with Screen headquarters at once.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Washington News

HIGHLIGHTING THE RECENT HEARINGS OF BOREN SUB-COMMITTEE

▶▶▶ The most intensive investigation into paper production ever conducted by a Government agency was that of the so-called Boren Sub-Committee of the Committee on Interstate and Foreign Commerce of the House of Representatives for two weeks during October. Hearings began October 7, after the Commitee had conducted extensive hearings in New York, Canada and the Pacific Northwest. Before preparing its report, the Committee proposes to devote a day to hearings in Duluth, and to spend two and a half days each in Oklahoma and Texas, beginning November 9.

While the Committee has delved into every phase of the problems of paper production, the outsanding feature of the entire series of hearings is the request by the newspaper publishers that the Tariff Act be changed to permit the admission of lighter weight papers, and other grades now dutiable as printing paper. To change the law to the extent proposed by the newspaper publishers would mean that papers now dutiable would be admitted duty free for the use of any consumer, not merely the newspaper publishers. The effect of this change in the law would work havoc in the groundwood paper field, and indirectly in the book paper field, and if carried to its normal conclusion would result in mill changes only comparable to those made when the newsprint industry was moved to Canada by the placing of newsprint on the free list.

Government officials were interrogated during he Committee hearings, and many startling features developed during the sessions of the Committee, which met for wo weeks for about seven hours a day.

The newspaper publishers' proposal was presented officially by the American Newspaper Publishers' Association, which asked that the present Tariff Act, now merely specifying the duty free status of standard newsprint, be amended to "permit the importation, free of duty, of newsprint paper used in the printing and publishing of newspapers." The publishers specifically advocated the duty-free admission of paper from 25 pounds to 35 pounds basis weight. They stated that extensive experiments had been made with the use of 30-pound basis paper.

Harold Boeschenstein in charge of the new Forest Products Division of the War Production Board advocated free admission of paper down to 30-pound basis, but R. S. Kellogg for the Newsprint Service Bureau testified that the use of such lightweight paper was uneconomic. He said the production of the lighter weight would slow down the speed of paper machines, would require the use of more sulphite, and would cost $4 to $5 per ton more than present production cost. He said this was the reverse of conservation, and presented a statement made by the newspaper pressmen's union, confirming his own statement as to the practicability of the use of such paper.

Throughout all the hearings the problem of paper was stated to be the lack of woodsmen to get out pulpwood, and other suggestions to meet the situation were merely auxilliary proposals to the solution of the main problem of getting out the wood.

The *Chicago Tribune* offered to move three of its Thorold (Ontario) paper machines to the States to make paper from de-inked stock, thereby saving both manpower and natural resources.

Brig. Gen. Blackshear Bryan, Assistant Provost Marshal General, said that as many as 20,000 to 40,000 prisoners of war are available, if the paper companies will comply with needed requirements of the Army.

Other high spots were the statement that despite the paper shortage in this country, exports of newsprint in the last year were three times the volume shipped in the two years before the War. Chairman Boren indicated resentment at efforts of Government agencies to keep these figures secret, and issued them himself to newspaper correspondents. Agitation by the Cromwell interests for the use of their method of de-inking paper brought out the statement from the War Production Board that it could see no reason why the Government should finance this one out of some 200 patented processes for de-inking paper for reuse in paper manufacture.

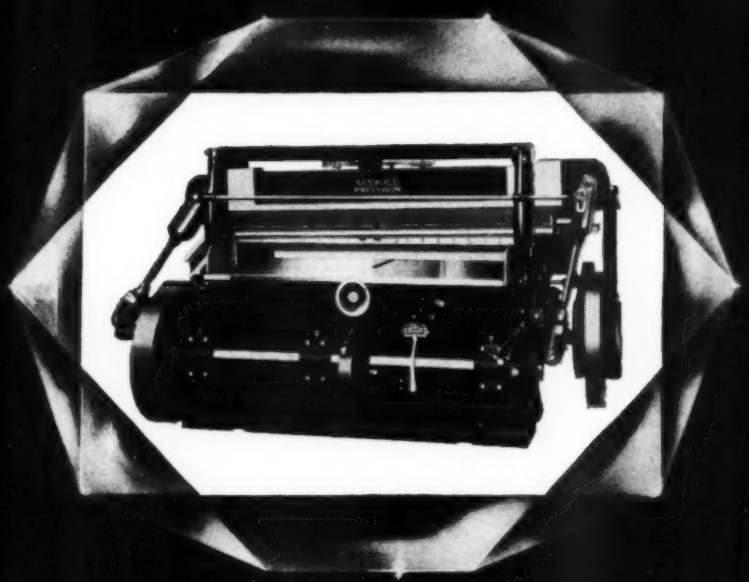
Out of all this discussion, however, has come the announcement that an advisory committee will be named by publishers to conduct exhaustive experiments in the use of lightweight newsprint on all kinds of newspaper presses. Rex W. Hovey, newly named head of the Paper Division of the Forest Products Section, said such a committee was being formed, and Harry N. Bittner, head of the Printing and Publishing Division, said he believed such use of lightweight paper would be practicable.

While this series of hearings developed the nature of the problem of an adequate supply of paper, the international Combined Pulp and Paper Committee of the Combined Production and Resources Board and the Combined Raw Materials Board released a report on paper manufacturing conditions, hinting that a 52 per cent reduction in the use of newsprint and wrapping paper may be necessary. This Committee consists of one representative each from the United States, Canada and the United Kingdom, and indicated that it considered the paper industry of the United States and Canada as a continental industry, not two industries in two separate countries. The manner in which the production and resources statistics were presented indicated a trend in that Committee toward establishing a free trade status between the two countries in the paper field, though no direct statement to that effect was contained in the publicity release.

▶▶▶ FURTHER STEPS HAVE BEEN taken to curtail the use of printing papers by an order restricting commercial printing to 85 per cent of the 1941 usage. Additional cuts in the use of newsprint by newspapers will be averted for the time being by a forced reduction of inventories, to compensate for the 16 per cent deficiency in supply.

▶▶▶ THE PRESIDENT APPOINTED *Reuben B. Robertson*, executive vice president of Champion Paper and Fibre Company, as an industry member of the War Labor Board on October 29. John P. McWilliams, president of the Youngstown Steel Door Company, Cleveland, was appointed as alternate. Mr. Robertson replaces Cyrus Ching, U. S. Rubber Company, who resigned.

▶▶▶ PROSPECTIVE PLANS for the sale of the Canadian interests of the A. P. W. Paper Company to Canadian buyers is announced in a report by Dwight G. W. Hollister, president of the company. The sale of its subsidiary, the Halifax Power and Pulp Company, Ltd., at Sheet Harbor, Nova Scotia, would give the parent company approximately $600,000. Proposals for refunding of the A. P. W. Paper Company's outstanding securities is also possible.



TREAT IT LIKE A JEWEL

...because it's got to last!

On account of war time restrictions there are no *new* Seybold Trimmers available. But with the simple, easy procedure outlined below, you can keep your Seybold machines in good working condition for years and years. Should you need repairs our nearest office will serve you promptly.

OLLOW THESE THREE EASY RULES FOR LONG-LASTING SERVICE

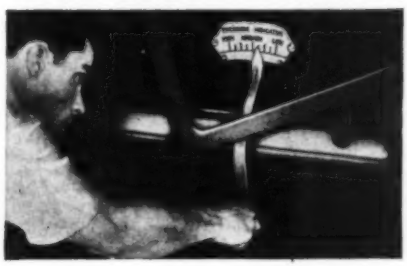
1 Do this once a day

Lubricate drive shaft bearings, clutch, and moving parts. Inspect cutting knife.

2 Do this once a week

Check the clutch and brake adjustment.

3 Do this once a month



Inspect the clamp pressure mechanism.

SEYBOLD

• DIVISION •

HARRIS-SEYBOLD-POTTER COMPANY

823 WASHINGTON ST., DAYTON 1, OHIO

STRANGE PAPER CO.'S WAREHOUSE TOTALLY DESTROYED BY FIRE

A spectacular all-night fire caused extensive loss to a Menasha, Wisconsin, paper company and a publishing house. The fire totally destroyed a four-story warehouse purchased recently by the John Strange Paper Company from the Menasha Woodenware Corporation. Located on an island in the Fox River Valley, this property adjoined the Strange company mill to the east and another large warehouse occupied by the George Banta Publishing Company on the west. The fire, of undetermined origin, was discovered at about 8:20 P.M., and within an hour the roof had caved in on the 300 foot long building. Although the firemen had the blaze pretty well under control by midnight, the blaze continued throughout the morning. Fire companies from Menasha, Neenah, and Appleton were called up.

The Strange Paper Company, which for some time prior to the fire had been short of valuable waste paper, lost a considerable amount of this stock in the fire. Valuable paperboard cartons used by the publishing house were stored in the burned building also. The entire contents as well as the building is a total loss. No accurate estimates had been placed on the loss but guesses have been around the $100,000 figure. A string of box cars, located near the building, were removed by switch engines before any damage befell them.

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ST. REGIS TO BUILD MULTIWALL BAG PLANT IN NO. KANSAS CITY

The St. Regis Paper Company, of New York, recently completed plans for the immediate erection of a new multiwall paper bag manufacturing plant in North Kansas City, Mo. Because of the ever growing demand for heavy duty multiwall paper bags to carry foodstuffs, chemicals, fertilizers, and building materials for essential civilian requirements, sustenance of the Armed Forces and for Lend-Lease, the Government has approved the full-speed-ahead completion of this project. The building contract has been awarded to the North Kansas City Development Company. Construction will start at once and the plant will be in full operation early in 1944, equipped to make sewn, pasted, valve and open-mouth bags and shipping containers, as well as small flour bags and sugar pockets. The new plant will be the eleventh bag factory operated in the United States by St. Regis Paper Company, pioneers in the manufacture of heavy-duty multiwall paper bags for domestic and overseas shipments. St. Regis also manufactures a complete line of automatic bag packing machines and bag closing equipment. In addition to the network of eleven bag plants in this country, St. Regis has three in Canada, three in South America, and before Pearl Harbor, also operated a plant in Japan.

The Kansas City factory will be a one-story building of modern design, following the War Production Board's war construction specifications. The most modern straight line production equipment can be accommodated in its 320 ft. length . . . rolls of kraft paper will come in at one end and the finished bags go out the other. Two hundred and fifty people will be employed in the exclusive manufacture of rugged multiple-walled paper shipping sacks which are now being used to package more than 300 widely varying products efficiently and economically. The specification kraft paper used in the construction of these moisture-resistant bags will come from nearby points. Rendering further assistance to the war program by conserving vital freight car space, the Kansas City plant will save car-miles now consumed in the long distance shipping of:

1) Kraft pulp from the Pacific Northwest and South to paper mills in the East.

2) The completed bags from the East to the "Bread Basket of America."

Washington estimates that there will be a total saving of 513,000 car-miles annually.

In the complex and hazardous business of wartime shipping, delays are extremely dangerous. Ships arrive with little advance notice and need flour . . . a cargo of flour must be packed, shipped and loaded so quickly that a minimum of time is available for shipment of the containers from the bag factory to the mill. The Kansas City plant will solve this problem for "bread basket" producers.

Producers and packers of flour and feed, chemicals, cement and other rock products, soy beans, cottonseed meal, foods, peas, beans and other free-flowing products are among those in the area who will benefit by the convenient location of the new St. Regis plant.

♦

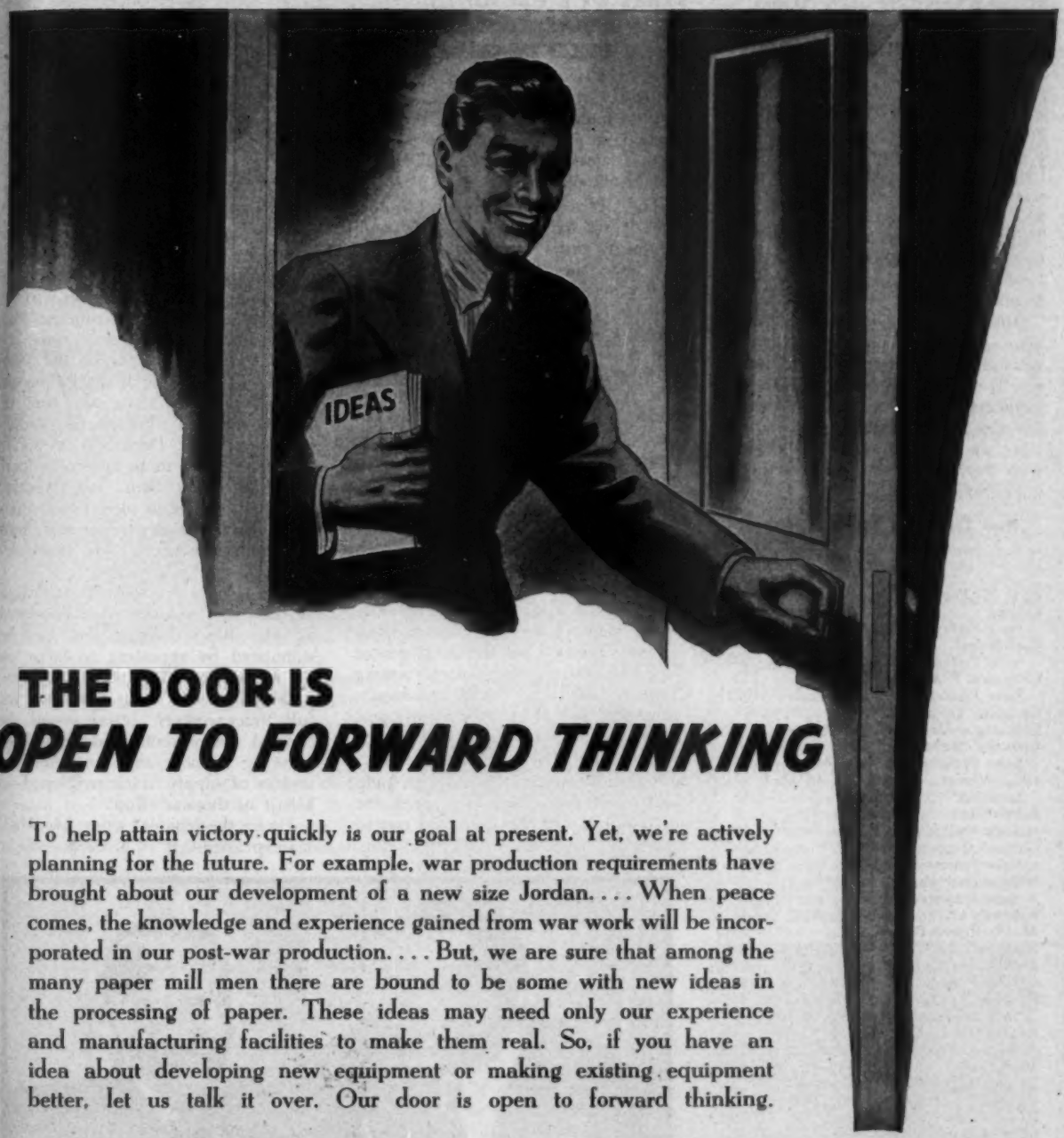
FINANCIAL

Signs of weakness in the securities markets had their effect on paper mill stocks, but as with other industrials, the weaker tone for prices was accompanied by a drying up of sales. Evidently holders of securities were not driven to liquidate their holdings by lower prices, indicating a belief in the inherent value of their equities.

American Writing Paper Corporation—Net profit for nine months ended September 30, 1943, was $172,651 as compared with a net profit for the same period a year ago of $212,446.

A. P. W. Paper Company — Net profit for the year to June 30 was $23,736, as compared with $206,974 for the preceding year.

Container Corporation of America —Net profit for nine months ended September 30, 1943 was $1,363,583, as compared with a net profit of



THE DOOR IS *OPEN TO FORWARD THINKING*

To help attain victory quickly is our goal at present. Yet, we're actively planning for the future. For example, war production requirements have brought about our development of a new size Jordan. . . . When peace comes, the knowledge and experience gained from war work will be incorporated in our post-war production. . . . But, we are sure that among the many paper mill men there are bound to be some with new ideas in the processing of paper. These ideas may need only our experience and manufacturing facilities to make them real. So, if you have an idea about developing new equipment or making existing equipment better, let us talk it over. Our door is open to forward thinking.

Jones

GEARED FOR WAR PRODUCTION

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

$1,738,475 for the same period in 1942.

Champion Paper & Fibre Company —Net profit for sixteen weeks to August 15 was $664,334, as against $672,763 for the corresponding period in 1942.

Masonite Corporation — Net profit for the fiscal year ended August 31 was $1,256,243, as compared with $1,616,806 for the preceding year. This reduction in net profit was in the face of a new high record for sales, federal taxes alone being over $3,000,000.

Minnesota and Ontario Paper Company—From the company's statement (including its directly or indirectly wholly-owned U. S. and Canadian subsidiaries) the consolidated net income for nine months ended September 30, 1943 was $1,221,694.30, as compared with $992,325.62 for the corresponding period of 1942.

New York Stock Exchange—Stocks

	Closing Prices Oct. 25, 1943	Sept. 25, 1943
A. P. W. Paper Co.	2½	1⅞
Celotex	12¼	13
Same Preferred	*18¼–18½	18
Certain-teed	* 5¾–6	6⅜
Same Preferred	67	64¾
Champion P. & F. Co.	*20–20¼	21
Same Preferred	107¼	107½
Container Corp.	21½	21
Continental Diamond.	*12–12⅜	12⅜
Crown Zellerbach	16½	16
Same Preferred	*98–98¼	98
Dixie Vortex	*13¾–14¼	15½
Same "A"	44¼	48
Robert Gair	*2⅞–3	3
Same Preferred	*13⅛–14	12½
Gaylord Container	12¾	12⅜
Same Preferred	51⅜	52
International Paper	13⅛	13¼
Same Preferred	66⅜	67¾
Kimberly-Clark	*30⅛–32	31⅜
MacAndrews & Forbes	25¼	28¼
Masonite	38	38½
Mead Corp.	8	8¾
Same Preferred	*83–85	86
Paraffine Cos.	*43¼–44	44¼
Same Preferred	*101¼–103	102
Rayonier	13⅜	14⅛
Same Preferred	31	31¼
Scott Paper	*38¾–39	41⅜
Same 4½% Pfd.	*108–111½	112
Same 4% Pfd.	*109¾–111	111
Union Bag & Paper	10	10¾
U. S. Gypsum	74½	75
Same Preferred	179	176

New York Stock Exchange*—Bonds

Abitibi 5%	.....	69
Celotex 4½%	101¼	101¼
Certain-teed 5½%	101	101¼
Champion P. & F. Co. 4½%	.....	.....
International Paper 5%	104	104
Same 6%	.....	107

New York Curb Exchange—Stocks

American Boxboard	.....	7⅞
Great Northern	.....	34⅜
Hummel-Ross	.....	4¼
St. Regis	3⅛	3⅜
Taggart	4¼	4
United Wallpaper	2⅝	2¾

*Closing Bid and Asked Prices.

FIRST OF 6 REGIONAL PULPWOOD CONFERENCES HELD IN GREEN BAY

▶▶▶ At a two-day conference held recently at Green Bay, Wisconsin, plans were formulated for boosting the production of pulpwood to supply mills in the states of Wisconsin, Michigan, and Minnesota.

The Green Bay conference was the first of six to be held in pulpwood producing areas throughout the Nation under the newly devised program to step up the flow of pulpwood to the mills (Cf. P. I. and P. W., Oct., 1943, p. 696). In charge of the meeting was A. B. Hansen, president-on-leave of Northern Paper Mills, Green Bay, who is in charge of pulp production under WPB's newly organized Forest Products Section, with Harold Boeschenstein as director. Frank Kelley (vice president of Northwest Paper Company, Cloquet, Minnesota), who has been named official WPB regional contact man for the industry, with offices at Green Bay, assisted in conducting the program.

Plans launched contemplate not only more intensive wood production from existing sources, but the development of new sources, particularly among farmers and other small producers, through a well-defined advertising program and personal contacts in the potential supply areas.

Critically needed increases in pulp and paper production are largely the responsibility of the mills and can be met to a large extent by local campaigns in every producing area, Mr. Hansen told the representatives. In urging local action, he promised industry the full co-operation of WPB through the new regional office under Mr. Kelley.

"The situation is serious," Mr. Hansen asserted. "We must raise pulpwood production through every possible source, including the farmer and small timber owner. Personal contacts, as well as publicity and advertising, are essential. The manpower problem is, of course, a stumbling block, but we are working on it right now, although I cannot promise that you will have it solved right away."

Frank Block, director of the War Activities Committee of the Pulpwood Consuming Industries, said that to date newspapers, through the American Newspaper Publishers' Association, have spent more money in local producing areas than has industry. "Now is the time to correct this situation and for industry to put more into this production effort," Mr. Block declared.

Details of a promotional campaign by the paper industry were presented by Mr. Block. Production can be stimulated by appealing to labor on the grounds of essentiality, patriotism, profitability, and draft deferment for full time workers cutting wood, he claimed. He also outlined methods of inducing farmers and other indirect sources of supply to cut pulpwood on behalf of the war effort.

Under the regional setup, Mr. Hansen explained that all problems will be

Frank Kelley (left), head of the new Lakes States regional pulpwood office at Green Bay, Wisconsin, is shown with A. B. Hansen (president of Northern Paper Mills) now head of WPB's pulp production program.

ON SHORT CENTER DRIVES . . . ON MODERN GROUP DRIVES . . .

GRATON AND KNIGHT

Research LEATHER BELTING

DELIVERS UP TO 40% MORE POWER —HAS UP TO 4 TIMES LONGER LIFE

Tough vertical drive — no stretch with "Research". In a metal working plant in Attleboro, Mass., six drives identical to the one shown at left, belted with "Research", have been in operation for over a year without any maintenance or take-ups. These drives are nearly vertical and excessive stretch in the belts would cause the belt to fall away from the motor pulley and result in lost power . . . proof of the efficiency of G & K's method of removing initial stretch during manufacture.

V-belts replaced — maintenance eliminated. In one of Boston's leading theatres, two 20" Graton and Knight "Research" heavy double belts were selected to replace rubber V-belts on two tough compressor drives. The rubber V-belts had to be run at such high tension that they caused trouble with bearings, belts stretched excessively and the whole drive required undue maintenance. The "Research" belts, installed in 1936, have operated continuously the past seven years without repairs or maintenance . . . proof that "Research" saves time and money, delivers more power and has longer life on tough drives.

Where chain drive failed "Research" succeeded. In a metal working plant in Pennsylvania, a 10" Graton and Knight "Research" medium double belt was selected for a tumbler drive, to replace a chain drive which was wearing out every six months. The "Research" belt, with pivoted motor base, has been in operation a year, and the department boss at the plant says of it: "Best drive in the department!" More proof that "Research" leather belting is best for heavy loads and shock loads and saves the user money by its long life.

HERE'S WHY "RESEARCH" BELTS ARE GETTING PREFERENCE...

Belt users have learned that the "built-in" pulley grip of "Research" belting — the result of carefully-controlled currying — provides up to 40% more power delivery than composition belts at the same tension. Non-elastic stretch is removed during manufacture by an exclusive process, and at the same time tensile strength is increased 15% above ordinary leather belts.

Patented "Tension-Cementing" — which distributes the cement uniformly while the plies are under tension — eliminates trouble from ply separation, and is an additional reason for specifying "Research" leather belting.

More pulleys are belted by Research than by any other brand!

GRATON & KNIGHT COMPANY
WORCESTER 4, MASSACHUSETTS

Graton & Knight is one of the many quality belting manufacturers with complete nation-wide service facilities. Branches in Chicago, Cleveland, Dallas, Detroit, Kansas City, Minneapolis, New York, Philadelphia, St. Louis, San Francisco; distributors in all industrial centers.

Look under "Graton & Knight" in Belting section of Classified Telephone Directory or THOMAS' REGISTER

directed to the WPB contact official for action, while Washington simply will act on matters of policy. The industry, in return, is to supply the regional representative with inventory, production, equipment, and other data essential to meeting their requirements, and this information will be used to assist individual companies.

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ARMY-NAVY DAY AT OSWEGO FALLS-SEALRIGHT COMPANY

Army-Navy day was observed at the Oswego Falls-Sealright Company plants in Fulton, New York on October 6. The occasion was highlighted by the appearance of a huge German army tank destroyer which was captured in Sicily and is the only one of its type to be displayed in upstate New York since its arrival recently in New York.

A military delegation of veteran service men under Major C. J. Bishop, of the Army, representing the Undersecretary of War, and Lt. (j.g.) John C. Boeshaar, of the Sampson Naval Training Station, gathered with more than 2,000 employees and guests in the Container Plant for an Army-Navy rally. They heard battle-front experiences described by several service men, including two former fellow-employees; Pvt. Walter Breen, who was wounded in Sicily, and Pvt. Richard Firenze of the Marines, recovering from wounds received at Guadalcanal.

An official War Department movie was shown to the employees, who were complimented for their part in war production by the Army and Navy spokesmen.

◆

WASTEPAPER

The nation-wide campaign to conserve wastepaper goes on with increased interest.

A three-point attack designed to break a serious black market in wastepaper and to increase supplies for the manufacture of paper boxes, boards, and other critically needed shipping materials was outlined jointly on October 26 by C. E. Wilson, Acting Chairman of the War Production Board, and Chester Bowles, general manager of the Office of Price Administration.

Key points in the joint program are:

1) OPA ceiling prices on wastepaper will remain unchanged. Dealers and suppliers cannot benefit by holding off supplies awaiting higher prices.

2) Special OPA investigators have been assigned in the drive against any wastepaper handlers who violate wartime price ceilings. Simultaneously, the WPB indicated that it was considering directives or other controls on the distribution of wastepaper to help wipe out the black market by channeling wastepaper into areas of greatest need.

3) A paper salvage campaign is being undertaken by the WPB to increase the recovery of wastepaper by nearly one third.

Approximately 6,000,000 tons of wastepaper a year is normally collected and sold for use of paperboard makers. Increased demands and shortage of woodpulp require an additional 2,000 tons of wastepaper.

Only about 35 per cent of the available wastepaper in the country is now being salvaged.

◆

ELEVENTH GATHERING OF GAIR OLD TIMERS

The Gair Old Timers Association held its eleventh annual banquet October 23 in the Grand Ballroom of the Hotel New Yorker. This year about 130 members attended the banquet, which featured, in addition to the election of officers and a floor show, a special sale of War Bonds.

This unique organization has some 400 members and operates without

Frank E. Forsbrey

dues, individual responsibilities, or individual benefits. It has made a number of permanent contributions to the achievements of Robert Gair, in whose memory it was founded.

This year each of the members received a *de luxe* booklet designated as "Deka-log of the Gair Old Timers." The "Log" is a beautiful souvenir, a real work of art. The title stamped in gold is protected with a transparent plastic cover, with flexible plastic binding. It includes a history of the Association, together with its ideals and objectives. There is also a complete roster of Association members, as well as the constitution and by-laws. There are many pictures of company officials and Association past presidents. The Deka-log has been deposited in general and historical libraries.

The new president elected for the coming year is Frank E. Forsbrey (formerly Gair Purchasing Department), assistant vice president and general manager, Paper Division, The Pulp & Paper Trading Company.

◆

A CHIEF OF POLICE AND ONE OF HIS MEN HELP IN PAPER MILL

One Saturday night early in October, the Great Northern Paper Company, Millinocket, Maine, was short of men for the midnight shift on the paper machine. This fact came to the attention of the city's chief of police, Allen M. Picard. Realizing the critical need for keeping paper machines in operation, Chief Picard and one of his men, Wilford Comeau, substituted on the midnight shift; the Chief working as fourth hand and Mr. Comeau as fifth hand. The machine crew reported both performed their work in a very creditable manner.

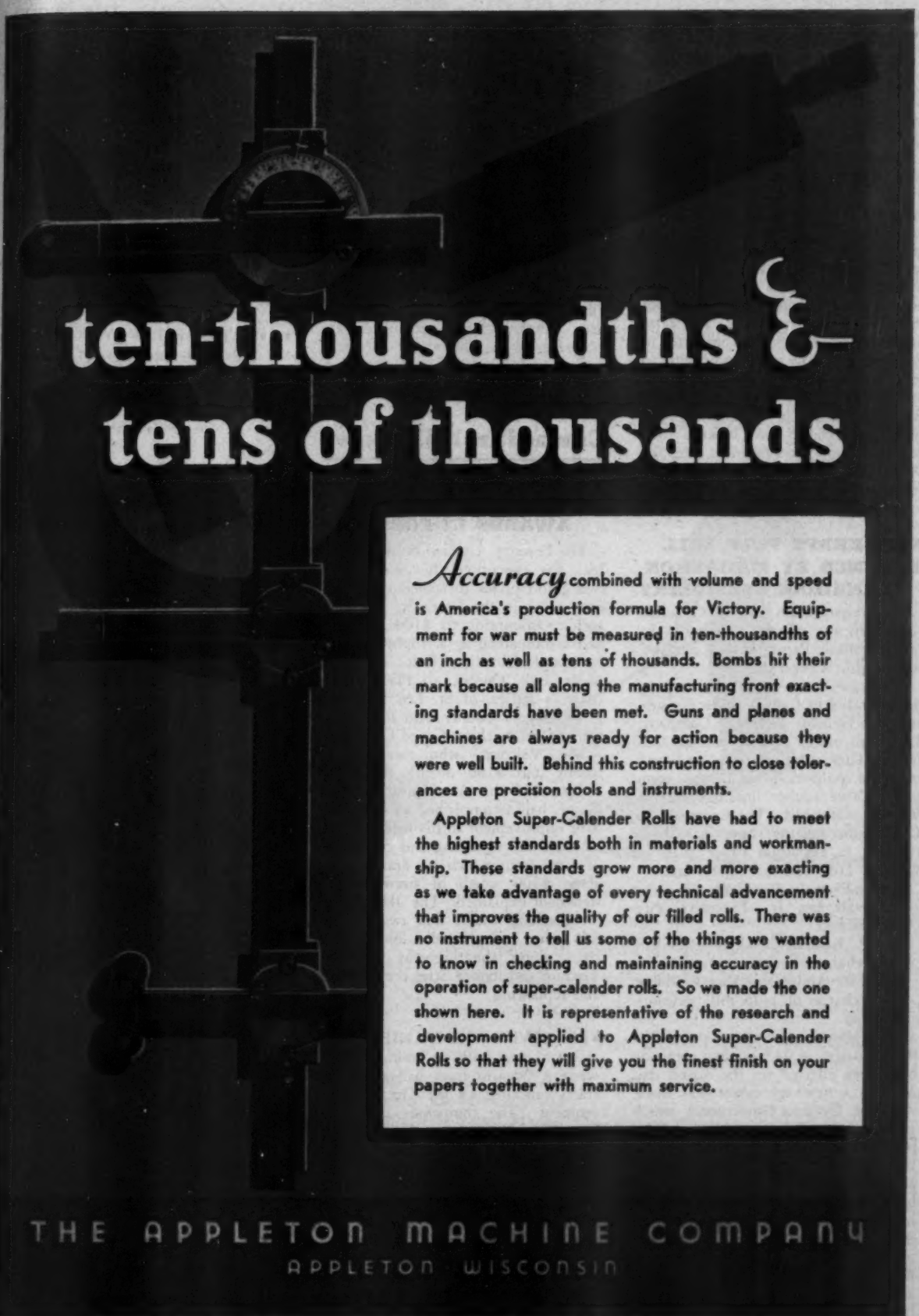
In a letter to this magazine, Chief Picard writes: "We were indeed glad to be of assistance to the company in their shortage and have assured them of our support in the future if need be. To be true, we offered our assistance after we had served our regular hours required on police duty, which, in my case as Chief of Police, was sixteen hours or more. But we are all in this War! So if it is work for one, it is work for all if we are to have VICTORY."

◆

REPORT MADE BY THE HERTY FOUNDATION

A report made public October 25 by Georgia State Auditor B. E. Thrasher, Jr., revealed that the Herty Foundation ended its fiscal year June 30 with a cash surplus of $3,809 after spending a total of $25,134 for laboratory research and woodland division work seeking to devise methods to improve products manufactured from wood pulp and to create new uses for it.

During the year, the foundation spent $21,311 for laboratory research. It spent $3,823 for the woodland division, a new activity for the period which has been discontinued. Expenditures exceeded income by $209.47, thereby reducing the cash balance of $4,019 on hand at the start of the year to $3,809 at the year's end.


ten-thousandths &
tens of thousands
Accuracy combined with volume and speed is America's production formula for Victory. Equipment for war must be measured in ten-thousandths of an inch as well as tens of thousands. Bombs hit their mark because all along the manufacturing front exacting standards have been met. Guns and planes and machines are always ready for action because they were well built. Behind this construction to close tolerances are precision tools and instruments.
Appleton Super-Calender Rolls have had to meet the highest standards both in materials and workmanship. These standards grow more and more exacting as we take advantage of every technical advancement that improves the quality of our filled rolls. There was no instrument to tell us some of the things we wanted to know in checking and maintaining accuracy in the operation of super-calender rolls. So we made the one shown here. It is representative of the research and development applied to Appleton Super-Calender Rolls so that they will give you the finest finish on your papers together with maximum service.
THE APPLETON MACHINE COMPANY
APPLETON · WISCONSIN

PALESTINE IMPORTER WISHES CONTACTS WITH AMERICAN PAPER MFRS.

An interesting communication has been received by this magazine from M. Ryftin, P. O. B. 94, Jerusalem (Palestine).

Mr. Ryftin states that he is an old established manufacturer's representative on the M. E. markets—Palestine, Syria and Egypt. He wishes to communicate with American manufacturers, exporters of cardboard and paper of all description, who would be interested in making an arrangement for him to act as a commission agent for the sale of their products. He states he has been an agent and importer in Palestine for many years and is able to send reliable orders for goods to various manufacturers in America. Mr. Ryftin states he is anxious to make some good connections looking to a resumption of good business after the War. He mentions three banks in Jerusalem as references.

◆

NEW KRAFT PULP MILL PLANNED BY MARATHON CANADIAN SUBSIDIARY

A reorganization of its Canadian subsidiary was effected October 1 by the Marathon Paper Mills Company, Rothschild, Wisconsin.

Since 1937, the Marathon company has operated in Canada under its subsidiary, General Timber Company, Ltd., with offices at Port Arthur, Ontario. This company produced and exported pulpwood from the company's large timber holdings on the Big Pic watershed. The name of the Canadian company now has been changed to Marathon Paper Mills of Canada, Ltd., and the officers are:

D. C. Everest—President
John Stevens, Jr.—Executive Vice President
H. P. Klinestiver—Vice President in charge of timber operations
Niles M. Anderson—Vice President in charge of pulp mill development

The Marathon company states that these changes in its Canadian company have been effected for the reason that recently a new agreement was made with the Ontario Government which provides for the construction of a bleached kraft pulp mill at Peninsula, Ontario, when equipment is procurable. Since 1937, the company has been working toward the development of this project. (Cf. *Paper World*, Sept., 1937, p. 10.)

The office at Port Arthur remains as before, having charge of timber operations. The company also has established an office in Toronto, located at 320 Bay Street in the Canada Permanent Building, which office will function for carrying on the design of the new mill.

Niles Anderson and Grant D. Ross, who has been engaged as engineer, were with the St. Regis Paper Company, Tacoma, Washington, at the time that mill closed November 1, 1942, due to WPB restrictions affecting mills in the Puget Sound area. Mr. Anderson was mill manager; Mr. Ross, plant engineer. They already have taken up their duties in Toronto. Since last March, Mr. Anderson has been connected with the Ontonagon Fibre Corporation, Ontonagon, Michigan. Both of these gentlemen are graduates of the University of Washington, and each has an outstanding record of paper mill experience.

Canadian Mill News

ANGLO-CANADIAN AND FORESTRY ASS'N GIVE AWARDS IN FORESTRY

The Forestry Association of Quebec, Inc., has announced the awarding of two grand prizes for outstanding forestry work in the lower St. Lawrence region, amounting to $100 and $50 and accompanied by a trophy donated by Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec, to Placide Valcourt, a settler, of St. Léo le Grand in Matapedia County, and to the 4H Club of St. Joachim, Gaspé County.

Mr. Valcourt, who received the trophy and $100 during the recent congress of the Association, held at Gaspé, had accomplished an extraordinary improvement in his forest, which included new planting and cultivation of land from which he draws yearly about $400 worth of firewood, the statement explained. The 4H Club of St. Joachim, which was awarded the $50 prize, had planted a long row of trees along the highway near St. Joachim and looked after their growth and replanting.

▶▶▶ SEVEN COMPANIES which failed to erect mills on limits in northwestern Ontario have had their contracts cancelled by the Ontario Government. The companies are: Pulpwood Supply Company, Ltd.; General Timber Company, Ltd.; Huron Forest Products, Ltd.; English River Pulp and Paper, Ltd.; Soo Pulp and Paper Products, Ltd.; Vermillion Lake Pulp Company, Ltd.; and Western Pulp and Paper Company, Ltd. Three of the companies have been conducting cutting operations and will be assured adequate cutting rights to maintain employment.

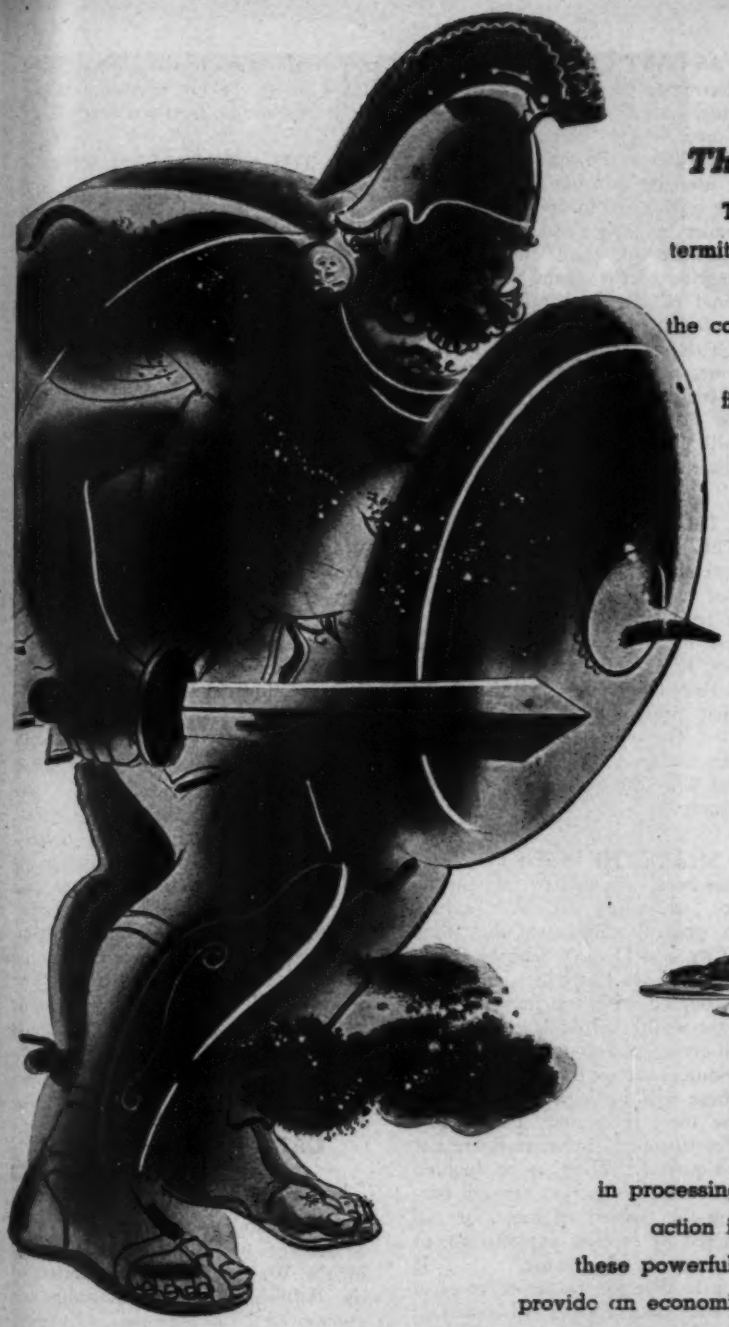
▶▶▶ DISCUSSING THE WOOD FUEL shortage and the crisis facing Canada's pulp and paper industry because of a lack of wood cutters in the forest, Per Wijkman, Consul General for Sweden, suggested that Canada might take a leaf from Sweden's book in the effort to find a solution to the manpower and resultant wood shortage. Mr. Wijkman referred to the case in Sweden where over 40,000 nonprofessional wood cutters were used while the largest quantity of wood that had ever been cut in Sweden was being lumbered during the period July, 1942, to June, 1943.

▶▶▶ THE BEST WAY TO SOLVE the acute crisis due to wood shortage, is the designation of the Canadian pulp and paper industry as an essential industry (the same as has been done in the United States) and the placing of 20,000 internees or prisoners of war in the forests to cut wood. This statement was made by E. Howard Smith, president of the Canadian Pulp and Paper Association in an address before the members of the Advertising and Sales Executives Club on October 6.

▶▶▶ A NEW AND MORE ACTIVE ERA for the forest industries of Canada involving higher employment and expanded foreign trade is at hand. This opinion was expressed by W. Garfield Weston, Canadian industrialist and British M. P. who recently purchased the E. B. Eddy Company, Hull, Quebec, and the J. R. Booth Company, Ltd., of Ottawa. However, Mr. Weston believes this prediction is predicated on a determined effort to banish the ravages of forest fires, and rational forest management so as to operate all timberlands to produce their fullest harvest of wood materials without any diminution for all time to come.

▶▶▶ AN ACUTE SHORTAGE of pulpwood is likely to develop in the Soo District unless more men are obtained to work in the bush, according to D. J. Munto, woods manager for the Abitibi Power and Paper Company. Mr. Munro states his company has had only 300 men in the bush, less than half the number employed at the same time last year. He further states that between 1,500 and 2,000 men could be used if they could be secured.

▶▶▶ A FULLER SUPPLY OF MANPOWER may be assured within a short time if the Canadian Government takes contemplated steps which are necessary to gain that objective.



This War Will Last Forever

The war against mold, decay, germs and termites is your daily business. It is important business—business that doesn't wait—for the cost in both time and materials runs high. To help in this endless industrial fight against fungi and bacteria, Dow has developed a series of 17 chlorinated phenolic derivatives—the *Dowicides*. These products have proved their value in many fields—paper, leather, paint, lumber, textile, and many more.

Dowicides are employed in finishing compositions and in processing operations. In all cases, the inhibiting action is thorough and dependable. Investigate these powerful germicides and fungicides today. They provide an economical and effective way to improve manufacturing operations and make vital materials last longer.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN
New York • St. Louis • Chicago • Houston • San Francisco
Los Angeles • Seattle

IN THE PAPER INDUSTRY: Protective Services Provided By Dowicide—Preservation of lap and pulp stock—Dowicide F or G; longer felt life—Dowicide G; preservation of mold-resistant paper products—Dowicide A, B and G; prevention of decay and termite attack—Dowicide G; for reducing maintenance costs—Dowicide 7, preserves structural timbers. Write for full details.

DOWICIDE

GERMICIDES AND FUNGICIDES

DOW

CHEMICALS INDISPENSABLE
TO INDUSTRY AND VICTORY

This measure will be to raise the production of pulpwood to category "B" which would place it in the same category with industries whose manpower is protected by recent regulations of the National Selective Service. One of these regulations provides that no person employed in industries of A or B category may be freed for another job or get a separation certificate without approval of National Selective Service.

PAPER MILL MACHINE SHOPS DOING WAR WORK

The machine shop of Powell River Company, Ltd. (Powell River, B. C.) started war work with a specialized job on corvette lubricators. The shop is now on valves and steering bases for 10,000-ton cargo ships. The foundry is producing gears and cargo winches, hydrant caps and parts for fire protection at airports and army camps.

The machine shop at The Great Lakes Paper Company, Ltd. (Fort William, Ontario) is turning out sirens for the Canadian Navy. It makes the patterns and does the machining and finishing of castings which are made in a neighboring foundry.

The Manitoba Paper Company, Ltd. (Pine Falls, Manitoba) is a long way from the sea, but the machine shop has made hundreds of bronze valves for Canadian warships and has machined racer rings, training racks and carrier rings for 4-inch gun mounts, and bronze washers for aircraft carriers.

The comparatively small shop of Provincial Paper, Ltd., at Port Arthur, Ontario, is running about 60 per cent on war work, turning out valves, etc., for cargo vessels, 7x10 winches, and boiler mountings for mine sweepers.

About 80 per cent of the machine shop work at the Riverbend (Quebec) mill of Price Bros. & Company, Ltd., is for the war effort.

▶▶▶ ESTABLISHMENT OF a chipping plant to supply material for pulp mills is under consideration by the International Pulpwood Supply Company, an extra-provincial firm with registered offices at Vancouver. According to information received by the Victoria solicitors for the company, the concern plans an investment of between $100,000 and $125,000. The firm is making an application for an easement to erect a conveyor over a portion of Harbor Road. It seeks a location on Canadian National Railway land on Harbor Road, together with foreshore lots at the location.

▶▶▶ AS PART OF ITS FUEL conservation program the Powell River Company, Ltd. (Powell River, B. C.), has closed down its new grinding room division at Powell River. The power used by this unit of the mill is being transferred to operate an electric boiler recently installed in the plant, which will lower the fuel oil consumption of the steam plant. The personnel of the new grinder room (about fifty men) will be distributed through the other departments of the mill. Steam generated by the boiler, a second-hand unit, will go to the digesters, Flakt dryer, Kamyr machine, old mill paper machines, tram lines, and other smaller units.

▶▶▶ THE THREE-MAN COMMITTEE appointed by Premier Drew on September 20 to seek some normal form of management for the Abitibi Power and Paper Company, has held its first meeting. Honorable Frank Hughes, K. C., of Toronto, chairman of the committee, said after the meeting that things were getting along steadily. The other two members of the committee are Prof. Gilbert Jackson and Wm. Zimmerman, K. C., both of Toronto.

▶▶▶ SHARE-THE-EFFORT education has been proposed by the City of Quebec, according to T. Taggart Smyth, general manager of the Montreal City and District Savings Bank. The City wishes this educational program coupled with any movement to share-the-wealth. In this respect, the wealth-giving powers of Quebec's forest resources are of particular interest, but these will be kept in hand only by the most meticulous precautions. Mr. Smyth said "Timberlands are not a fixed quantity. They can be doubled in their wood production through control by the trained engineer, or can be halved by careless exploitation, or wiped out entirely by fire. . . . If we are to face the future of employment with confidence, it is logical that we should set ourselves to build up to its highest potency the forest resources from which employment flows."

▶▶▶ THE JOINT ANGLO-CANADIAN-AMERICAN committee which has been investigating the pulp and paper situation has warned of the possibility that an increasing shortage of paper may force newspapers in the United States to curtail their size drastically, and that supplies of newsprint may be cut next year 20 to 52 per cent under this year's levels unless more men are found to cut pulpwood. The committee urged immediate action to bolster the force of pulpwood cutters in the United States and Canada. It is estimated about 38,500 additional men are needed.

▶▶▶ THE SULPHITE MILL of Bowater's Newfoundland Pulp and Paper Mills, Ltd., has ceased operation for an indefinite period. Shortage of wood is responsible for the shutdown. Employees have been transferred to other departments of Bowater's so no unemployment will result. There are rumours that the production of newsprint will be curtailed at the end of the year.

▶▶▶ BECAUSE OF AN ACUTE SHORTAGE of men in its woods department, the Thunder Bay Paper Company, Ltd. (Port Arthur, Ontario), has cut down its newsprint department from a six to a five-day week. Men employed in the newsprint department continue to work the full six-day week, but on the day the newsprint machines are shut down they work in other departments.

▶▶▶ AS PART OF ITS BROAD PROGRAM of postwar development and expansion, the Powell River Company, Powell River, British Columbia, will install, after the war, a revolutionary new mechanical process in its pulp and paper mill to remove the bark from logs by a water pressure process instead of the revolving drum barker method in use since the plant's inception thirty-two years ago. The new method which will reduce labor and material waste to a minimum is known as the hydraulic barker.

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VICTORY PULPWOOD CAMPAIGN TO CARRY ON TO END OF 1943

▶▶▶ As a part of his progress report covering the period from July 1 to September 30, Frank Block, director of the War Activities Committee of the Pulpwood Consuming Industries, announced it has been decided to continue the industrial phases of the Victory Pulpwood Campaign through the remainder of 1943.

Pulpwood consuming mills, which contributed to the campaign originally on the basis of 5 cents for each rough 128-cubic foot cord of domestic pulpwood consumed during the first quarter of 1943, are now being solicited for additional donations on the basis of the second quarter, to finance the industry's campaign through December 31.

"The opportunity to make this campaign pay off in cords of wood is knocking right now at the door of every pulpwood consuming mill," the

STRANGER THINGS THAN THIS WILL HAPPEN

Who twenty years ago would have believed that today we would have beaters handling 10,000# gulps of 6% kraft . . . with no more space than the old type Hollander needs?

Who twenty years ago would have believed possible a tiny chest holding but 500# of 6% stock, yet processing it fast enough to keep a big 100 ton machine rolling?

Stranger things than this will happen . . . meaning that our artist's conception of the 1963 refining system may not be so far off after all.

In any case, if you have figured out a way to improve some mill unit or to do something new, lay your idea before our board of strategy. Mill ideas helped create the machines of the past . . . mill ideas will help build the masterpieces of the future. The Black-Clawson Co., Hamilton, Ohio. Shartle Division, Middletown, Ohio. Dilts Division, Fulton, N. Y.

SHARTLE Dilts

BLACK-CLAWSON SHARTLE-DILTS — NO. 1 IN PAPER MILL MACHINERY RESEARCH

committee report stated. "More farmers in all sections will shortly have more time to devote to pulpwood production."

The committee stated that many mills are implementing the national drive by placing advertisements in local newspapers in pulpwood producing areas.

"Publicity has been best in those areas in which mills have begun to back the campaign," the report added. "An immediate and aggressive advertising, publicity, and purchasing policy on the part of every mill will reap the harvest of wood-producing public opinion which has been nurtured during the past four months."

The report pays high tribute to the work of the Newspaper Pulpwood Committee in publicizing the need for pulpwood and its value to the war effort through 1,600 co-operating newspapers in 27 pulpwood producing states.

"The goal of the Newspaper Pulpwood Committee is to increase the flow of pulpwood to all mills regardless of their localities or products," the report said. "The Newspaper Pulpwood Campaign is a gigantic undertaking."

Among the accomplishments of the Newspaper Pulpwood Committee listed in the industry report are:

Formation of more than 1,200 local Victory Pulpwood Campaign Committees including county agents, foresters, pulpwood purchasing agents, mill representatives, ministers, and school superintendents.

Newspapers have distributed more than 275,000 "Uncle Sam Needs Your Trees" pamphlets.

More than 30,000 "I have enlisted" Victory pledge buttons have been provided pulpwood cutters by newspapers.

Over 50,000 copies of a WPB folder "Notice to Farmers With Woodlands" and 15,000 WPB "Cut Pulpwood Now" posters have been ordered by the newspapers for local distribution.

"Many newspapers have gone much further than simply forming committees," the report added. "Pulpwood day rallies, personal contact campaigns, public contests, etc., are being organized by many editors to stimulate their own areas."

The Newspaper Pulpwood Committee has sent several quarter-page ads to the co-operating newspapers, chiefly weeklies, in the pulpwood producing states. It also has provided them with a continual supply of news stories and news photo mats, and has made available 250 movie trailers through state press associations.

"A conservative estimate indicates that the ratio of publicity and editorial space to paid advertising is 4 to 1," the committee reported.

The War Activities Committee has had excellent co-operation from the Federal Government, the report stated. The War Production Board and the Department of Agriculture have been particularly helpful in lending their facilities to the campaign, it explained, and the War Department has backed up the drive in the South by conducting a "Salute to Wood Caravan" through ten southeastern states.

Support also has been given the campaign by former OPA Administrator Prentiss Brown, War Manpower Commissioner Paul V. McNutt, and ODT Director Joseph B. Eastman.

The report revealed that a Farm Press Pulpwood Committee has been formed under sponsorship of the Agricultural Publishers' Association and the National Publishers' Association and is preparing to launch a three-point pulpwood promotion program.

"More ads will be supplied mills during the coming weeks," the committee said. "Principal efforts from an advertising point of view will be directed toward urging the mills to use these ads to best advantage by placing them in newspapers in their pulpwood producing areas."

FROM PIPE WORRIES, TOO!

WITH NAYLOR...

THE LIGHT-WEIGHT PAPER MILL PIPE

Carefree performance has earned for Naylor the reputation as *the* paper mill pipe. You can depend on Naylor because it is built to handle jobs normally requiring heavier-wall pipe, thus giving you a safety factor that eliminates a lot of headaches. At the same time, its light weight and ease of handling assure economies that add up to real savings.

Write for Naylor Catalog

Check These NAYLOR Performance Advantages

- Always accurate in diameter
- Concentric ends match correctly
- Easier to install
- Holds true cylindrical form
- Stays tight and leakproof
- Stronger—safer
- High salvage value
- Light weight saves steel
- Cuts maintenance costs
- Saves money

Sizes 4 to 30 in diameter—all types of fittings, connections and fabrications

Naylor

NAYLOR PIPE COMPANY

1236 East 92nd Street • Chicago 19, Illinois

SELECTING THE RIGHT "Size" FOR TODAY'S NEEDS

To produce Rosin Size in conformity with top quality standards requires the strictest technical control over manufacture. Here at Cyanamid, the Rosin Size produced is continually checked throughout manufacture to make certain that all shipments meet the rigid standards established by the company. In addition, Cyanamid's research staff is constantly at work to effect improvements that will help the manufacturer in the use not only of Rosin Size, but other essential paper chemicals and specialties developed and produced by Cyanamid.

Cyanamid manufactures a complete range of rosin sizes from gum or wood rosin, pale grades for light colored papers and other more economical grades for use where color considerations are secondary.

During recent years pale wood Rosin Size comparable in color to high grade gum size has been produced, bringing to the paper manufacturer the much sought after advantages of exceptional cleanliness and uniformity.

Because Cyanamid Rosin Size plants are strategically located to provide prompt service to all centers of the paper industry, shipments can be quickly made in either bags, drums, or tank car lots as determined by the mill management. Likewise, experienced Cyanamid service men are "on call" to see that you are reliably, continually, and economically supplied with the chemicals essential to your manufacture. Full details of Cyanamid's paper chemicals products and services may be obtained by addressing any of the company's offices listed below.

Cyanamid Rosin Sizes are made under strict technical control to assure highest quality and uniformity.

Waxes • Rosin Size • Synthetic Resins • Casein • Alum Sulphonated Oils • Fillers Defoamers • Soda Ash • Caustic Soda • Salt Cake • Acids • Clays Satin White • Aerosol® Wetting Agents • Calmicro (Calcium Carbonate) and other Paper Chemicals

*Reg. U. S. Pat. Off.

American Cyanamid & Chemical Corporation

[A Unit of American Cyanamid Company]

30 ROCKEFELLER PLAZA · NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Massachusetts; Philadelphia, Pennsylvania; Baltimore, Maryland; Charlotte, North Carolina; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California; Seattle, Washington.

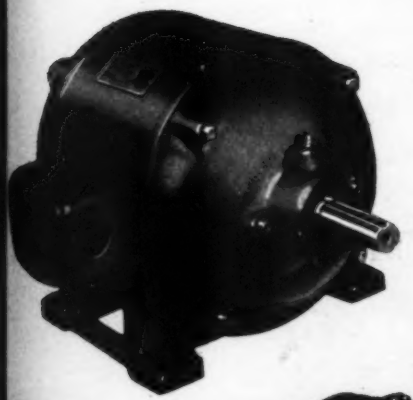
ONE THING FOR SALE ...THREE FOLKS TO BUY
AND SO THE PRICE GOES UP SKYHIGH!
WITH PRICES HIGH YOU WANT A RAISE -
THAT STARTS A GREATER SPENDING CRAZE!
UP
UP
UP
UP UP
THIS CRAZY WHIRL IS CALLED INFLATION
AND IT ALONE CAN WRECK A NATION!
LET'S ALL STOP PRICES GOING HIGHER
BE A SAVER - NOT A BUYER!

Seven things you should do:

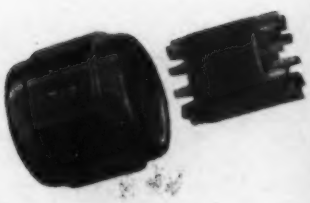
1. Buy only what you really need	**2.** Pay no more than ceiling prices... buy rationed goods only with stamps	**3.** Pay off old debts and avoid making new ones	**4.** Support higher taxes ...pay them willingly	**5.** Provide for the future with adequate life insurance and savings	**6.** Don't ask more money for goods you sell or work you do	**7.** Buy all the War Bonds you can afford – and keep them

Keep prices down...use it up, wear it out, make it do, or do without

This advertisement, prepared by the War Advertising Council, is contributed by this magazine in cooperation with the Magazine Publishers of America.



There is a size and type ***LOUIS ALLIS*** *electric motor for every industrial requirement.*



THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

Let's first WIN this war!

We won't ever have a second chance—

The Gerjaps are waging a vicious determined war — a cruel fanatical war to kill, conquer and loot their foes — a war of no quarters and of no compromise — either we defeat them — or they will conquer us!

And unless WE win — neither we nor our children's children will ever have a second chance.

We here at Louis Allis are forcing our every effort in every way to help win this war — to get it over as quickly as possible.

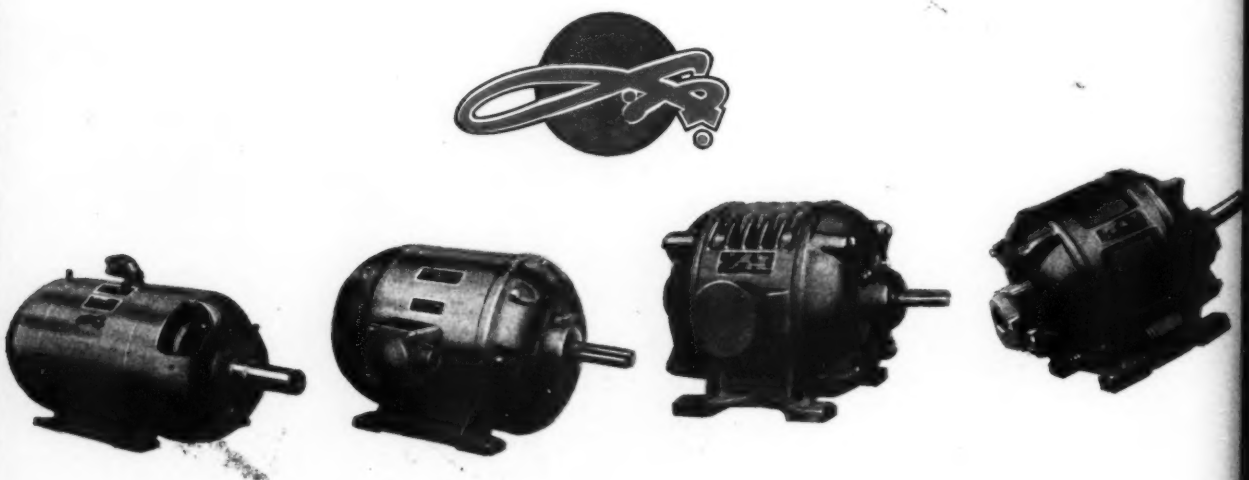
Our engineering development department has created many outstanding — perhaps revolutionary — improvements in electric motor design — construction and performance —

Motors that are serving a major important role in helping your boy and mine win this war — to help bring him back home — safely — as quickly as possible.

Many of these important new motor developments will also play an important role in the post war period.

But now is not the time to discuss them — let's first WIN this war!

THE LOUIS ALLIS CO., MILWAUKEE, WIS.



They Saved Money by Throwing Felts Away

There comes a point in every dryer felt's life when it begins to waste more money than its replacement involves. When its fibres lose their resilience and capillary attraction for moisture, the felt becomes waterlogged and inefficient.

A good example is the recent report from one mill which states that they found it possible to make a material saving in steam cost alone by discarding old dead felts with glazed-over and clogged weave, and installing new HOOPERWOOD Cotton Dryer Felts—enough saving in steam alone to pay for a new felt every week—not to mention the material increase in drying capacity and consequent greater production.

This is only one of many cases where progressive mills, today, are saving money, not by "stretching the life" of old felts, but rather by replacing them as soon as their drying efficiency begins to fall off. It is just plain good business.

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The Pulpwood Famine

▶▶▶ HAROLD BOESCHENSTEIN, who is now director of the Forest Products Bureau, WPB's reorganized Bureau which includes lumber, wood pulp, paper and paper products, recently made an appeal to these industries to make every effort to conserve the dwindling supplies of pulpwood. He summarized his appeal as follows:

1) Make every possible effort to increase production of pulpwood.

2) Make pulp go as far as possible by voluntary reduction of weights, dilution with paper stock or fillers, etc.

3) "Voluntarily cut down or eliminate the production of nonessential or luxury products and utilize your facilities and your materials to as great an extent as possible for the making of those products which are most essential and in those grades and types which are most economical in meeting essential needs."

Mr. Boeschenstein's appeal merely points out and summarizes the situation in the industry that has obtained this entire year, but does not get to the root of the matter which is the procuring of more woodsmen to go into the forests to cut pulpwood. The essence of the entire problem is the shortage of manpower in the woods.

Up to date of this writing, we have seen no evidence that more manpower to cut pulpwood will be available. As evidence that the manpower shortage is critically acute in this country, we quote Brig. Gen. Leonard P. Ayres of Cleveland, who, on October 15, said:

"Two tough problems confront the Nation: How to raise the additional manpower needed for the campaigns of 1944 and how to produce the additional munitions needed for those campaigns."

"We shall require 3,000,000 more men for the Armed Forces, and in addition we shall need 3,000,000 more men and women for the war industries, for an over-all increase in the physical volume of industrial output in 1944 of 11 per cent over the probable total for 1943."

On October 22, Washington dispatches said that Senator Chandler of Kentucky proposed in the Senate that "wood pulp be declared a strategic material and that enough trained loggers be released from the Armed Services to forestall a further newsprint shortage." He further added: "The current shortage of wood pulp, from which newsprint is made, has reached serious proportions. There should be no shortage of newsprint in this country. We have the necessary material; we have the trained men, and we need the newspapers." . . . "Two things have contributed to this condition: First, an apparent lack of a definite policy in the distribution of the available supply and, second, the fact that many loggers producing the necessary material in the forest from which wood pulp is made, were either drafted or allowed to go into higher paid jobs in the shipyards and industrial plants without due regard to their value in their own work."

On Friday, October 28, Representative Boren, in behalf of his Committee in the House of Representatives, placed the whole matter of manpower shortage in the forest in the hands of the President, appealing for immediate action.

We are now in the month of November, confronted with an unprecedented demand for paper and paper products and with a critical decrease in pulpwood supplies to mills which make the vital commodity—paper.

Yes, there is a most unusual campaign of publicity and advertising being waged throughout the forest regions of the Nation. Appeals are being made in local newspapers and by commercial bodies to the local inhabitants to cut more pulpwood. These appeals are predicated upon the assumption that there are men in those regions who can cut pulpwood and who are not doing so.

The critical need is for more men to cut pulpwood.

In 1939, there were almost one million wage earners in the forests. These men were among the first to be taken by draft and the Man Power Commission, but by far the greatest loss of men was to the defense industries where very high wages induced them to leave their former jobs. These men are practically lost for the duration. Even though the Government should endeavor to operate upon the suggestion made by Senator Chandler — that loggers in the armed forces and defense factories be returned to the woodlands for pulp cutting — we do not see how it is practicable to winnow these men out and return them in time to obviate the pulpwood famine toward which we are certainly moving.

A Salute to Mill Foremen

▶▶▶ IN THESE DAYS, when the problems of the pulp and paper industry run the gamut from manpower shortage to pulpwood shortage and even shortages of other items, including equipment, our hats are off to those individuals responsible for making the wheels go 'round—the mill foremen.

When labor shortages first started to develop, these men, perhaps reluctantly in some cases, took the responsibility of using women on many jobs for which women previously had never before been employed. They have done a good job in getting these new employees, most of whom probably had no previous industrial experience of any kind, to work safely and efficiently. They also have made use of older men and young men to the advantage of the industry.

When the pulpwood shortage became imminent, it was the foremen who had to make effective such changes in operating procedures as had been conceived to meet the critical situation. Here again they have scored a victory. In spite of obstacles which at times must have seemed almost insurmountable, they made paper. They are making paper today, and they will continue to make paper no matter what the duress.

When it became difficult, if not altogether impossible, for mills to purchase new machinery in the manner that they did in former years, it was up to the foremen to improvise, to make over, to repair and patch as they possibly had never done before. This is still necessary; and the foremen continue to show that they can take it.

These men are the top sergeants of the industry. They are on the firing line where industrial battles are lost or won. They take orders and give them. They get things done.

The Victory of Pearl Harbor

▸▸▸ FROM F. F. SMITH, of the Monsanto Chemical Company, St. Louis, comes this interesting and illuminating narrative of one of the medical developments which largely lined with silver the black treachery of the Japs at Pearl Harbor, that sleepy Sunday morning when all Honolulu was just rubbing its eyes and taking a deep morning stretch. When the first planes appeared, an early riser downtown looked up and muttered to himself "Patrol planes coming in." To Navy men, ashore and on shipboard, it was just another Sunday morning. An alert corporal, practicing with the sound detectors, heard the planes coming and so reported to his lieutenant. The lieutenant shrugged his shoulders and walked away. A Navy chaplain and his assistant were preparing the afterdeck of a battleship out in the harbor for Sunday services.

In less than a half-hour the United States was at war with Japan.

The early riser in downtown Honolulu was streaking for safety, but didn't make it. Navy lieutenants, ensigns and bluejackets ran for their ships to man the guns. They fought that morning with torn and sweat-stained uniforms. The alert corporal was well on his way to a decoration and promotion, while his lieutenant was fighting the Japs and kicking himself. The Navy chaplain and his assistant were at machine guns, hammering at the raiders.

On that Sunday morning every living soul in the United States who knew about the attack on Pearl Harbor could scarcely guess the terrible havoc and death coming from the skies. But it wasn't until months later that the news of a great American victory at Pearl Harbor was released. It was called the Victory of Sulfanilamide.

The full story of the sweeping victory of the sulfa drugs is contained in a detailed report of the Army's surgeon, General James C. Magee, by Dr. Harris Long of Johns Hopkins Medical School—the man who introduced the sulfa drugs to America. Dr. Long was accompanied on a mission to Hawaii by Dr. I. S. Ravdin, professor of surgery at the University of Pennsylvania. The report from Hawaii contains these startling highlights:

In Army hospitals the doctors saw badly wounded men who looked and felt well. They were "amazed" at what they saw. Men who by all past standards should have died were recovering, eager to get back into the fight. There was absence of pus in the men's wounds, mildness of post-operative reactions, and swift, clean healing of wounds. Sulfa drugs plus good organization that was giving the wounded prompt attention performed this wonder.

Wounds were first debrided, which is to say that every bit of dead or dying flesh that could give food for germs was cut away. Then sulfanilamide was dusted into the wounds, 68 grams (more than two ounces) at a time. Then each man was given sulfathiazole by mouth, as a further aid in stopping invading germs before they could do any damage. That morning when the first alarm sounded, 14 pounds of sulfa drugs were brought up from the basement of Tripler hospital, in readiness for the doctors.

Even among the men whose wounds had been contaminated with the fertilized and dirty soil of Hickman and Wheeler fields, and who had not had their wounds cleaned out by debridement for 24 hours,—not a single massive infection was found ten days later.

The infection, which during World War I killed 80 per cent of the men with abdominal wounds alone, scarcely occurred in Hawaii. Among the cases which involved compound fractures of bones, records show that less than four per cent of such injuries became infected. Not a single loss of arm or leg was necessary because of infection. The only amputations reported were those made by shell splinters and other missiles.

Since Pearl Harbor, and the knowledge gained there in the treating of battle casualties, the sulfa drugs have grown in stature as one of America's prime war weapons.

A brilliant general once summed up the true perspective of war with these words: "The army that will win the final battle will be the army with the best remnants." No one likes to think of wounded men as remnants, but in the harsh parlance of war, human life is reduced to mechanical terms. We make elaborate precautions for repairing our weapons in the field, and now we make even more elaborate provision for the inevitable thousands of battle casualties. The United States intends to have the best remnants in that last great battle.

Another step forward in the treatment of casualties is found in the War Department announcement that every soldier going into combat area will carry, as an essential part of his fighting equipment, a package of sulfanilamide tablets. Twelve of these tablets, in a special, spill-proof metal box, is going along with every fighting man and that provision is already proving itself to mean the difference between life and death on the raging battlefields. The men receive instructions in the drug's proper use from the medical officer, and careful checks are made periodically to make certain each soldier has the required packet of tablets.

A more recent development in the use of sulfa drugs by the armed forces is the perfection of a new container for single doses of sulfanilamide powder. It is a shaker type of paper package designed for use in the field where facilities for sterilizing medical supplies may not be available. Sulfanilamide, like everything that touches a wound, must be sterilized. Small, single applications of the sterilized drug are enclosed in plastic envelopes and by tearing off the tab end of the package, the powder can be dusted into the wound.

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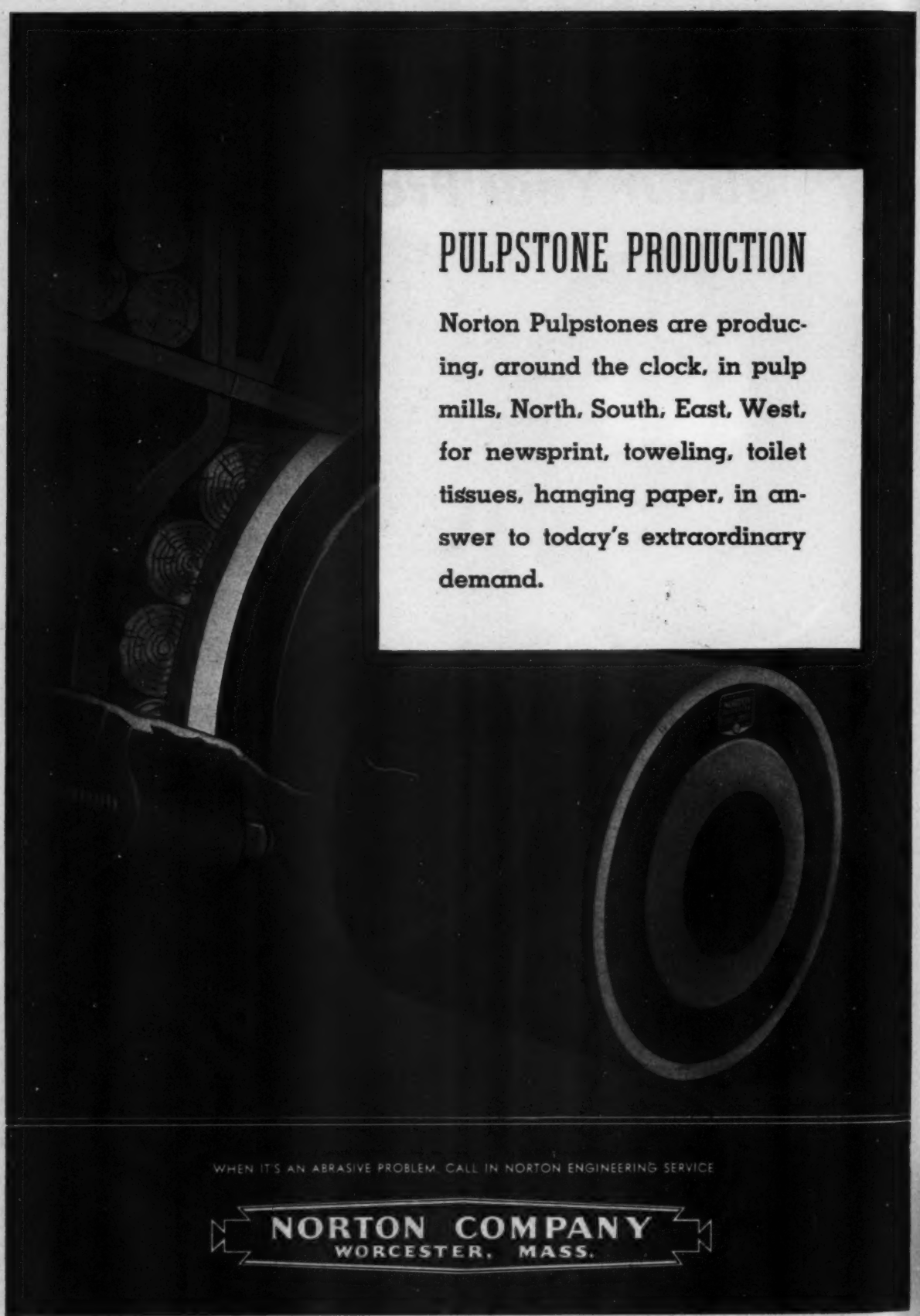

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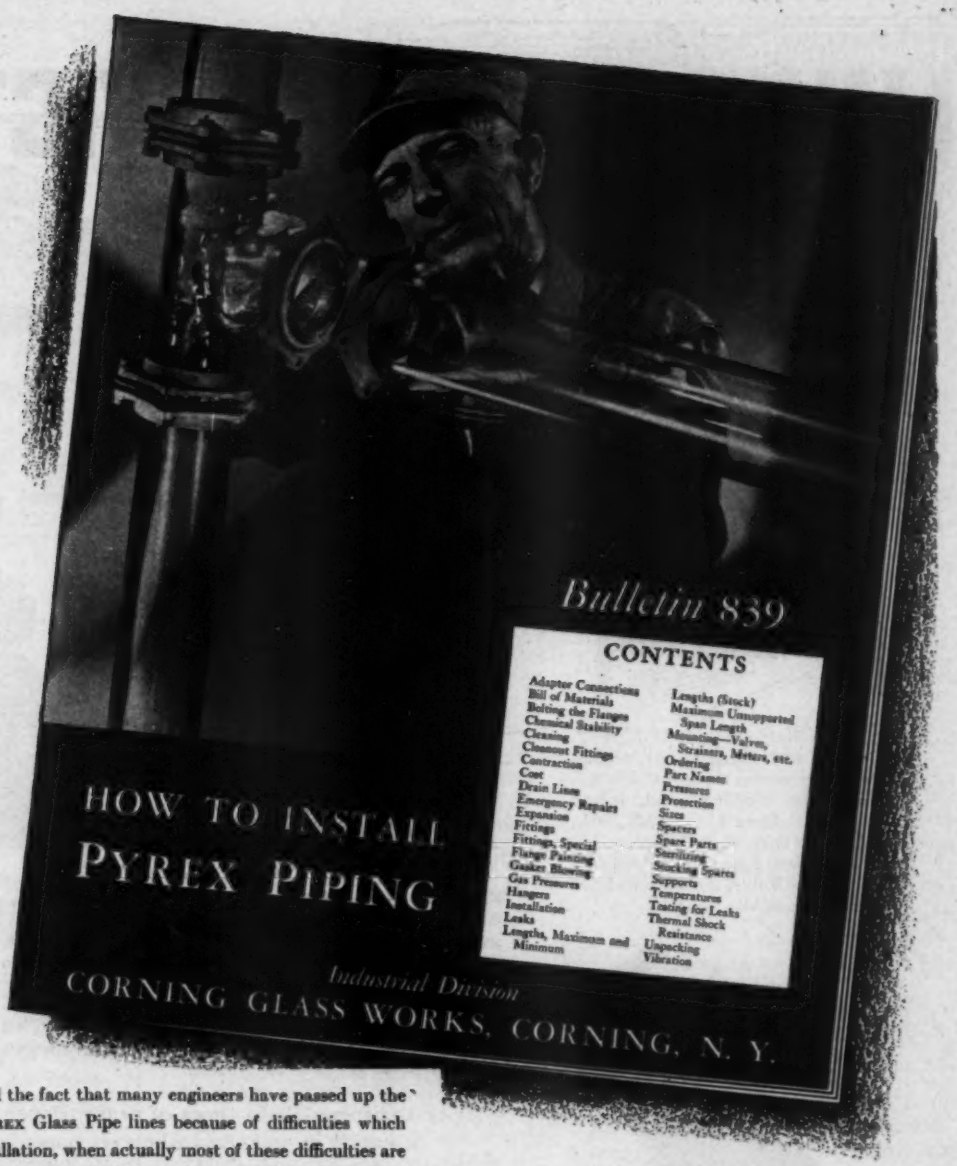

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Fig. 2453—Stainless Steel O. S. & Y. Gate Valve, with flanged ends, outside screw rising stem threaded through bronze bushing in upper yoke arms, full flanged bolted yoke, and taper wedge solid disc. Sizes 2½" to 30", incl., for 125 pounds W. S. P. For sizes ¼" to 2", incl., Fig. 1969 is available.

Fig. 1816—All-Iron O. S. & Y. Gate Valve, with flanged ends, outside screw rising stem, bolted flanged yoke and taper wedge solid disc. Sizes 2" to 30", inclusive, for 125 pounds W. S. P. Figs. 1816 and 2161, are especially adapted for handling sulphate liquors (for black liquors special trim is available).

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The British Paper Industry's Part in Total War

EDITOR'S NOTE: Some of the difficulties that British papermakers are faced with under war conditions, and the remarkable way in which they have overcome them are described. The British paper industry is playing an important role in the industrial and production battles of the war.

The author is Professor of Forest Chemistry at the New York State College of Forestry and Research Collaborator in the U. S. Forest Service. He is now in Sweden studying the pulp and paper industry there under wartime conditions. While in England he visited a number of representative paper mills, as well as research institutions, and had an opportunity to discuss papermaking problems with many of the leading technical men of the British paper industry and with Government officials.

▶▶▶ GREAT BRITAIN HAS BEEN ENGAGED in war for about four years now — a total war, with all that the word "total" implies. In so far as is necessary, the entire population has been put to work on the war effort. Every essential raw material, every important industry, every valuable facility, no matter how small, is organized to contribute its utmost to production for war or for those basic civilian needs which are necessary for the life of the country, and, indirectly, also for the war.

The paper industry is no exception. So essential are paper products to the life of the Nation and the direct military prosecution of the War, that the collapse of the paper industry would have lost the war in a comparatively short time. Yet this vital industry was in a critical position after the Scandinavian pulp raw material market was cut off by the Norwegian invasion.

Britain is not a pulp-making country. Except for esparto pulp made from an imported North African grass and rag pulp for making high grade writing and fine papers, nearly all the pulp needs of the country were imported, mostly as wood pulp from Scandinavia. The loss of both the Scandinavian wood pulp and the North African esparto sources of import created a serious situation. It could not be met by importing all the pulp needs from the United States or Canada, because shipping tonnage is needed for carrying military material and food. The problem had to be solved at home, in Britain, and it has been done in the following way:

1) Conservation of pulp stocks on hand and control of supplemental wood pulp imports from North America and Russia.

2) Restricted use of unnecessary paper.

3) Extended use of salvaged fibers including recovered blitzed paper stores from damaged warehouses, blitzed manila, old jute bagging, old Manila rope and sisal string, old carpets and household waste paper, for which intensive salvage campaigns are put on.

4) Manufacture of pulp from new domestic fiber sources, mainly straw, but including some wood waste and local woods.

The general paper problem was further complicated by the sudden demand for the production of new paper products for direct military use. This meant plant and raw material adaptions in many cases for the manufacture of these special papers going into military articles. The war also increased greatly the demand for certain lines of paper for government use, such as security paper. These new production problems had to be fitted into the general control of fiber raw materials and paper outlined above.

The Paper Control

In order to carry out such a program of control, organization is necessary. This the government provided, not only for the paper industry, but for all essential major industries. The organization for the paper industry is termed The Paper Control and is under the jurisdiction of the Ministry of Supply.

Fibrous raw material is allocated to the mills by The Paper Control and remains the property of The Paper Control until used. The use of the

raw material and the type of paper made is controlled by a licensing system, which is the key to the whole control system. The application for a license for a given order of paper must include the type of paper, the use intended, and the fiber raw material composition. No paper *may be delivered by the producer* without a license, and no license is granted if the paper does not have the fiber composition called for and have the prescribed physical properties for the price grade which is claimed for it. This system places a legal obligation upon the producer to meet the conditions agreed upon. It greatly simplifies administrative effort over any other licensing system and insures a maximum effective control.

The Paper Control is not necessarily interested in the complete fiber furnish, but does specify maximum proportions of certain types of fiber, for example, kraft or bleached sulphite or a certain quality rag. If the producer is ingenious and can use less than the permitted maximum of certain fibers by diluting with others of less priority and yet maintain the quality of the sheet, that is satisfactory. It is to the interest of the industry to extend the fiber supplies by using, as much as possible, fibers of lower priorities in so far as compatible with sheet qualities. This serves as a stimulus to ingenuity and it is astonishing to see what can be done in making paper from a strange assortment of fiber raw material.

Naturally, the sheet must still meet the quality and physical properties for the price grade claimed. The customer usually sees that it does. In fact, since prices are fixed there is a resultant quality competition for the private orders having some latitude in specifications.

The restricted use of paper, particularly in bulk lines, such as newsprint and wrapping, is accomplished by setting a ceiling tonnage figure for a given period based on a certain per cent of the prewar amount used. For example, the amount of prewar tonnage of newsprint allowed, manufactured at present, is 15 per cent. These figures may be changed at intervals to meet changing conditions or needs. Certain unnecessary uses of paper are abolished completely, such as napkins, cups, festoons, and many other items.

It is the duty of The Paper Control to make necessary adjustments so that, in so far as possible, no mill will be put out of business by the misfortunes of war. For example, a tonnage compensation was put into effect, whereby mills normally using bleached sulphite pulp and having no pulping facilities were provided with paper from mills with esparto digesters which enable them to make most of their pulp requirements by pulping straw. The over-all costs of production for various lines of paper are carefully determined and the prices fixed accordingly to allow a fixed margin of profit.

The Paper Control has the obligation to make regulations which are most suitable to the national interest. It is with this consideration in view that raw materials are allocated and the production of different types of papers are licensed to the mills most suited to make them. In general, there is excellent co-operation between all parties concerned. This system has been the salvation of the industry in Britain and has permitted the mills to keep operating on the limited raw materials available.

Fiber Raw Materials

Almost everything that has a recoverable fiber is used as raw materials for paper, including old jute sacks, treated and weatherworn burlap and cloth strips used for camouflage, old Manila rope and sisal string, old carpets, blitzed paper from damaged warehouses, all types of cloth trim, military and domestic wastes, and waste paper. Most of the new fiber obtained from plants and trees is obtained by pulping wastes, such as straw, wood wastes, and flax combings. A small amount of native pulpwood, mainly Scotch pine, is cut.

North American sulphite, and southern pine, Canadian and Russian kraft pulps are imported in limited quantities amounting to only a fraction of the normal imported pulp requirements. These high priority fibers are carefully reserved and used for papers which require them to meet the necessary properties and quality for the intended use. The change from Scandinavian to North American pulps has required a certain amount of adaptation. They have different beating characteristics, hydrate more slowly, and size differently. Their good strength and freeness make them easily blended with slower, shorter fibers, such as straw, waste wood and waste paper to make satisfactory papers.

Waste paper is the keystone of the fiber raw material structure. The public is asked to co-operate in the recovery of all paper and regular collections are made. Household wastes and the results of salvage drives are a horrible mixture of papers ranging from high grade papers to dirty boxboards and trash. Usually no attempt is made to separate household wastes. The bales are broken open on a conveyor and the obvious extraneous items which come to light are picked out. Various types of breakers and potchers are used to pulp the waste, segregate the heavy rejects, remove string, rope and rags, and settle out the finer dirt. The presence of bitumen coated papers causes difficulties. For certain papers de-inking is necessary. This may be done mechanically in a stock made alkaline. Various ingenious de-inking processes have been devised.

High Production Mills

The high production mills include makers of newsprint, cheap writings and printings, wrappings, and boards. In Britain these mills seldom have digestion plants and formerly relied on imported pulps. This coupled with the fact that they are high capacity mills creates a difficult situation. They must rely to a large degree on waste paper. Before the war, the board mills were the only large users of waste paper. They still receive the greatest share, since their products are, for the most part, directly essential to the war. Not only are these mills making packing boxes and cartons for military use, but shell cases, bomb components, and other important military items as well. These mills, therefore, receive a high priority for waste paper. Since a good portion of their products go overseas there is a drain on the waste paper reserve. This may be remedied by the partial digestion of straw by alkaline treatment at atmospheric pressure. Some pulp is now being made in this way.

Cartons contain about 50 per cent waste paper and 50 per cent kraft pulp. The distribution varies according to the type of box. A non-corrugated box may be made of a 50-50 mixture of the pulps. A corrugated type may have a 90 per cent kraft liner and a 100 per cent waste corrugated interior.

With the exception of one mill having its own ground wood plant, newsprint, cheap writing and printing papers are made from waste paper, with a possible admixture of some imported sulphite pulp. Common cheap printing and writing paper made from 100 per cent waste paper is called "straw paper."

The necessity for stretching the amounts of imported kraft pulp means that most wrapping papers contain large amounts of other fibers, such as waste paper, jute, rag, semidigested straw, or digested flax combings. The amount of kraft pulp used in a given paper depends upon the use for that paper. Cement sack paper draws the highest priority and may be 100 per cent kraft. Box liner paper may be 90 per cent kraft and 10 per cent

waste paper. Kraft sack and bag paper contains more waste; an example is one with 22½ per cent waste. Ordinary wrapping paper must contain much larger amounts of waste paper or other non-kraft fibers. A paper of 30 per cent kraft and 70 per cent waste is common. Less kraft can be permitted if jute or rag fiber is used. An example is a fiber furnish of 20 per cent kraft, 30 per cent jute, 40 per cent waste paper, and 10 per cent flax combings.

A good deal of jute has been released to the paper mills in the form of bags, many from old sandbag defenses, and strips used in camouflage. For use in wrapping papers, this material is cut, dusted and then digested with either lime or soda, the yields being about 70 per cent and 60 per cent, respectively. The drained material is then sent to a potcher where it is beaten and washed.

Rag Mills

There are many pure rag mills in Britain as well as esparto mills which also formerly digested rags. There is, therefore, a great demand for rags, especially since rag boilers are seldom suited for digesting straw. Top grade rags, such as new cuttings, are available for making high-grade specialty and security papers. However, many rags must now be used which would have been rejected prior to the war. Many allotments are of mixed quality and it pays to upgrade by hand sorting. Also, many rags are received which have been impregnated for war time uses, such as khaki trim, antigas cloth, tent fabrics, as well as blitzed material. These created a problem to get a white fiber without too great a loss in strength and in most cases it has been solved satisfactorily. A clean white pulp is also being made from old jute bagging.

Bleached sulphite or straw pulp is added to rag fiber for some papers. For example, there are rag-sulphite pulp furnishes of 25, 50, 75 and 100 per cent rag. Another furnish includes rag, bleached straw and waste paper in about equal amounts. In general there is an improvement in the quality of paper for documents, books and reports of permanent value, due to the increased use of rag fiber.

Straw Pulp

Before the war, esparto was one of the principal fibers used for papermaking in Britain. There are sixty-five esparto mills in Great Britain and Northern Ireland. When esparto could no longer be imported, there resulted a scramble for the limited amounts of straw then available until the price reached ridiculous figures. The Government, through the Ministry of Supply, advised that a buying and distributing agency for straw be organized. The esparto mills responded by forming The Papermakers Straw Trading Company, Ltd., setting up a small nominal sum as capital. The purpose of this company is to give service to the paper mills in the interest of the nation. It co-operates with, but enjoys freedom from interference by the Government. It is the buying agency for straw from the farmers and delivers the necessary amounts to all the mills.

With the increased agricultural program in Britain there is now ample straw for all the mills. Straw is seldom purchased beyond a radius of 35 miles from a given mill. About 6,500 tons of straw are now used per week. Only wheat straw is collected, except in Scotland where some oat straw is also used.

Every six months The Papermakers Straw Trading Company, in agreement with the Ministry of Supply and the Ministry of Agriculture, set prices. Dealers are given contracts to deliver to the mills at about $1.45 per ton. Transportation of straw is carefully controlled and no straw can be transported without a permit from The Papermakers Straw Trading Company. After paying costs of baling and trucking to the railway, the farmer receives about $6.00 per ton of straw. The price is kept somewhat high in order to stimulate agriculture and keep the farmer interested in supplying straw.

The straw is purchased on behalf of the Ministry of Supply and remains the property of the Ministry while stored at the mill. As it is used the mill pays the Ministry of Supply for it as pulp, on the basis of one ton of pulp per three tons of straw.

The organization and management of The Papermakers Straw Trading Company rests in the hands of the straw mills (former esparto). They have done an excellent job for the industry in seeing that all are treated justly and are provided with raw material.

The esparto mills have made a very creditable achievement in adapting their facilities to straw. The situation is not ideal for the maximum production of high quality straw pulp, because the existing plants are designed for esparto and not for straw. During the war it is not possible to make the fundamental plant alterations desirable for straw. As a result the yields and quality are lower and the alkali consumption higher, than would probably otherwise be the case.

The yields of bleached pulp are 30-33 per cent as compared with 40-43 per cent from esparto. Due to the greater bulkiness of straw, only about 65-70 per cent of the weight (of esparto) can be placed in a digester. In a low pressure rotary boiler using 40 pounds per square inch, about 30 per cent caustic soda is used, with a time cycle of about 11 hours. The higher alkali contents involved and the greater difficulty in washing the pulp reduce the soda recovery figures compared with esparto. The pulp bleaches readily but it is difficult to screen out all shives. The latter become conspicuous when the sheet is surfaced.

Straw pulp is slower than esparto and runs slower on the machine. However, the paper strengths and colors are about equally as good as esparto. Straw pulp makes a close sheet and it must be well conditioned to avoid cockling. Straw is used mostly for good grades of writing paper and for bond and other types of utility paper. A common fiber furnish contains 85 per cent straw and 15 per cent sulphite pulp. Sometimes rag pulp or better grades of recovered waste paper are mixed with the straw pulp.

In obtaining a good clean straw pulp there is a conflict between quantity and quality, because improvement of quality causes a decrease in yield or a slower pulp on the machine. In these days, of course, quantity is a necessary objective, and some quality factors must sometimes be sacrificed.

A small quantity of bleached straw pulp is being produced in a pilot plant by a modified Pomilio Process. The Celdecor-Pomilio Process, by the Cellulose Development Company. The process is a continuous two-stage operation, the first stage involving alkaline digestion and the second chlorination. A pulp in high yield and free from nodes and shives is obtained. The bleached product is sold to a fine rag paper mill where it is used as part furnish for the manufacture of sensitive photographic paper.

The alkaline stage of the Celdecor-Pomilio Process has been installed in an esparto mill to increase capacity. The pulp is carried through subsequent stages of treatment in the existing plant facilities.

Wood Waste

A number of mills are now producing a fair tonnage of soda pulp from wood waste. Most of the waste is in the form of shavings and turnings from planing mills and wood working plants. Some saw-trim and plywood trim from airplane factories is reduced by hammer mills and digested. A small amount of defective veneer is

also directly cooked. The lack of high pressure digester capacity limits the use of this material at most mills.

The shavings and strips are not over 1/8 inch thick and are a mixture of hardwoods and softwoods, including mostly spruce, several species of pine, elm, beech, ash and birch. It is estimated that about 30-40 per cent of the fibers in the shavings are cut. This results in a somewhat shorter fibered pulp than normally obtained from wood. However, it needs little beating.

When the waste is cooked in an esparto digester at 65-70 pounds per square inch, using 26-28 per cent caustic, 6-8 hours of digestion is satisfactory when using a two-stage chlorination bleach, whereas 8-10 hours is desirable for direct hypochlorite bleaching. One plant has higher pressure digesters permitting cooking at 110-120 pounds per square inch using 20 per cent caustic, for 35 per cent less time. Yields of 35-40 per cent on the basis of the air-dry wood are obtained.

The pulp is quite free and easier to wash than straw or esparto. The quality and length of the fiber are greater than anticipated. Satisfactory cheap printing papers are made with 100 per cent waste wood pulp. Frequently 20 to 35 per cent of other fiber, such as straw, waste paper, sulphite or mixtures of these, are added in making printing and writing papers. Thirty per cent wood waste pulp added to straw gives a satisfactory sheet of a quality resembling esparto paper.

Up to date the use of wood shavings is not controlled by the Government. However, The Paper Control keeps records of the amounts used for possible future value and consideration.

Native Pulpwood

There are two small sulphite mills and one large modern groundwood mill in Britain. These formerly pulped imported spruce. The sulphite mills now cook a heterogeneous mixture of native woods and the groundwood mill grinds mainly Scotch pine with some larch and imported spruce.

Since timbers for mine props have first priority in Britain, only poor grade crooked trees and logs can be used for pulp. Hence the bolts going to the grinders are more crooked than a dog's hind leg, are extremely knotty, and retain patches of bark. However, the presence of small amounts of bark is not too important since some dirt is bound to be introduced with the waste paper. Despite these difficulties a surprisingly good pulp is produced. The news sheet is made from a furnish containing about 40 per cent Scotch pine and 10 per cent spruce groundwood, with the remainder a mixture of waste paper and imported sulphite pulp.

A postwar forestry program is being advocated by the Government and it is quite possible that a modest pulp industry will ultimately develop using local woods. The matter is being given serious consideration as a far-sighted project.

Quality, Acreage and Research

Research by the mills during the war, of necessity, has been directed to improvising, adaptation, and the discovery of techniques of handling new fiber materials in the mill. There has been no time for long-range research. There is a general desire to pool information and the mills have set up, through the Paper Makers Association Technical Section, a Technical Advisory Committee. However, the need for long-range research is recognized and the mills, through the Paper Makers Association, have committed themselves to the organization of a central research laboratory and program after the war.

The mills have shown a great deal of ingenuity in making good quality paper from the materials at hand. There has been no decrease in the quality of papers used where permanent value is needed. In the use of the poorer grade fibers real achievement has been made in producing satisfactory usable paper. By altering techniques, the thickness of the sheet has been reduced with no resultant disadvantages in most cases. Whereas 40-45 grams per square meter was formerly considered the lower limit, it is now almost half this amount. A mill making much less tonnage of paper than before the war may actually be turning out a greater area. This is important in the spreading and saving of raw material.

Labor

The importance of the paper industry to the war is recognized by the Government and most mills are registered as "protected" establishments or "essential" works. Such mills have certain privileges of deferment of essential staff from military duty. However, the great need of people for direct military participation and munitions employment has caused a great labor shortage. Men of 18 and over are subject to draft as are girls of 18-25. Women up to 45, men up to 51 and skilled men up to 65 years, may be directed to war work or necessary industrial work. The result is that most mills employ a high percentage of women, old men and boys of 16-18.

A person directed to priority work cannot leave without permission of the employer or of the Ministry of Labor. All employers must notify the Ministry of Labor of all persons leaving their employment.

Women are doing a splendid job in industry and for the most part are steady and reliable. In the paper mills they are doing almost every type of work from the operation of machinery to plain labor. Many have disagreeable jobs, such as opening and sorting waste paper bales and loading conveyors, which they do without complaint. It is quite unexpected for an American, to see a gray-haired grandmotherly person operating a loading crane, or a young woman piling pulpwood bolts.

John Public and Paper

The average Britisher was never so paper conscious as now. The importance of saving and recovering paper is impressed upon him at every hand by poster, newspaper, radio and movies. Regular collections of waste paper are made.

Show window exhibits are displayed to illustrate the importance of paper to the war. A typical exhibit is entitled: "Waste paper goes to War." It contains an interesting display of some of the direct military uses of paper, such as for making shell cases, parts of a shell fuse assembly, tubes to be filled with explosives and inserted in shells, demolition containers, grenade tubes, a section of a wing of a Mosquito bomber showing paper and plywood lamination, and many objects made from laminated paper impregnated with resin, including mechanical and electrical parts for gun controls, airplanes, ships and tanks.

Perhaps of even greater educational value is the consumer's personal experience with the need for conservation of paper. His newspaper is only a fraction of its former size and he is lucky if he can get one. When he buys an article he must carry his purchase home unwrapped. The pipe smoker must bring a container when he buys tobacco. Many common uses of paper, unnecessary in wartime, have completely disappeared, such as napkins, handkerchiefs, and paper ornaments. The letter that John Public gets, is likely to be in a reused envelope, having a war economy label to cover the old address.

In these and many other ways the citizen is made to realize the importance of paper, both to the war and for the ordinary necessities and comforts of civilization.

PULPWOOD *from* FARMERS

K. E. BARRACLOUGH
State Supervisor (New Hampshire)
Emergency Farm Labor

ABOVE—Scaler measuring pulpwood for volume . . . BELOW—Partial cutting; about forty per cent of the stand has been removed. This is an excellent operation. Note well-formed trees in the foreground for future growth.

▸▸▸ THE FOREST PRODUCTS Association, Inc., was organized November 21, 1935, to serve farm woodland owners of the upper Connecticut Valley in Coos County, New Hampshire, and in Essex County, Vermont. It came into existence as an attempt to increase farm income during a period when both farmers and pulp companies were fighting for their economic existence.

Up to 1929, a balanced relationship, at least to some degree, existed between agriculture and industry in the area: The farmers were fairly prosperous. They were able to provide work for farm hands in the fields during the summer season, and in the woods during the winter.

With the gradual decline in agricultural and forest prices during the postwar period, with the chaotic price situation that developed following 1929, together with other economic maladjustments, the farmers in the region found themselves in distressed circumstances.

Many of the men who labored in the pulp mills, in the woods, and on the farms, were thrown on relief rolls. The pulp mills were operating on greatly reduced schedules, with large supplies of high-priced wood in their yards. Newsprint dropped from $75 to $36 per ton.

Like many industries, the pulp companies were overcapitalized. Often, they carried excessive overhead charges. With the restoration of some degree of confidence and with improvement in business the production of the mills increased, but they still were unable to purchase wood from the farmers in the region. Consequently, as a result of low prices for agricultural products and no market for pulpwood, well over 59 per cent of the farmers in the region were in serious difficulties.

It was because of this situation that the Extensive Service of the University of New Hampshire interested the farmers of the area in the organization of a marketing co-operative for their forest products. The Co-operative was loaned $100,000 by the Rural Rehabilitation Corporation (now the Farm Security Administration) for the purpose of making loans to members to permit them to carry on their pulpwood cutting operations. The marketing agreement provides that the Association can loan to the members at the rate of interest charged by the local banks in an amount not in excess of 60 per cent of the market value of the products for which it is secured.

The policy of using a forest products co-operative marketing association as a means to get forestry practiced on farm woodlands has its difficulties: The management of a co-operative is apt to become so engrossed in the difficulties of conducting its business that it neglects or disregards the long time program that reaches beyond the problems of marketing. Trained foresters experienced in co-operative management are not available; and the average business manager's interest in a long time program of forest management is quite secondary to his present day business problems.

While the members of the Forest Products Association, Inc., have not carried on a comprehensive program of forest management, they have been urged to apply good forest practices in the cutting of pulpwood and in the production of other forest products. The following clause, relative to forestry practice by individual members, appears in the marketing agreement: "To adopt and apply proper forestry practices as recommended by representatives of the Secretary of Agriculture and the Extension Service, in cutting timber from his woodlands and to handle woodlands in accordance with the principle of maximum sustained yield."

In 1939, the United States Forest Service, making use of CCC boys, completed an inventory of forest resources on the farm woodlands within the working area covered by the Forest Products Association, Inc. The survey revealed that there were 349,723,390 board feet of timber and 1,471,390 cords of wood on the 223,818 acres of woodland in the area, and that the total annual growth for the acreage is 63,793 cords.

Following the completion of the survey, the Extension Service placed a forester in the area to work with the

farmers for the purpose of getting them to build up the forest resources of their woodlands. The survey material is being used as a basis for laying out cutting plans for the individual member.

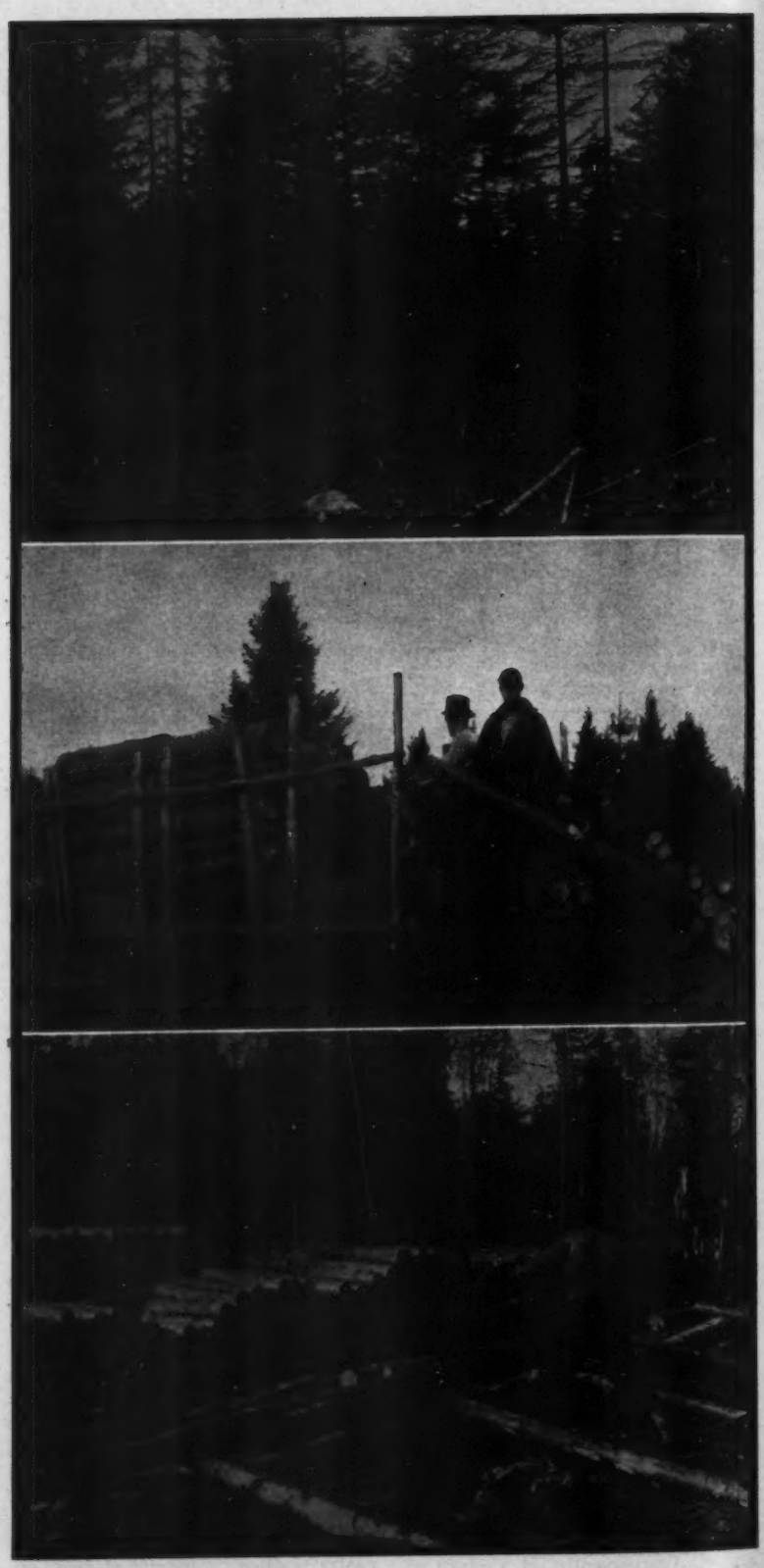
The accompanying table indicates the annual drain of forest products during the last decade from the woodlands within the area served by the Co-operative.

While the table indicates that the annual drain nearly balances with the annual growth, the quality of growing stock has become progressively poorer because of exploitation of timber without thought of future stands. Gradually, the supply of spruce has been reduced; and now accounts for only about 20 per cent of the softwood on the farm woodlands in the upper Connecticut Valley. The remaining 80 per cent is fir.

The Forest Products Association, Inc., since its organization in 1935 and in spite of poor management until two years ago, has marketed 84,000 cords of pulpwood and 7,225,000 feet of lumber for its members. Now, in spite of almost insurmountable difficulties resulting from labor shortages, the Association continues to function and to do its part in getting out pulpwood and logs so badly needed to meet the demands of war. Furthermore, with the co-operation of the Project Forester located in the area, the farmers are not allowed to forget the necessity of good forest management. The forester goes on each lot before cutting and advises the farmer where and what to cut. Often the trees to be cut are marked by the forester.

If the Forest Products Association, Inc., is able to survive the War, it may be expected that the farmers and the wood-using industries in the area served by it will continue to benefit from its efforts in the difficult postwar period ahead.

Normal annual purchase of pulpwood from area by local mills	30,000
Annual pulpwood purchases from area by outside mills	5,000
Normal annual purchase of lumber from area served by Co-operative	10,000
Annual fuel wood cut taken from area	15,000
Total annual wood cut from area	60,000 cords
Annual growth of forest products in area served by the Co-operative	63,793 cords
Annual consumption of pulpwood by local mills	300,000



ABOVE—Clear cutting in strips, recommended in pure stands of fir where stem-wise selection is not advisable . . . CENTER—Trucking rough pulpwood to the mill. All pulpwood from farm woodlands is trucked, although in a few cases it is shipped by rail . . . BELOW—Sawing and piling pulpwood.

Technological Problems in the Manufacture of Paperboard

NORVAL F. WILSON, Chief Chemist
Alton Box Board Company

▸▸▸ THE ALCHEMISTS OF CENTURIES AGO knew that all true wealth came from a few basic sources which were represented as earth and fire, air and water. Man gradually learned to contrive more complex materials leading to our light metals and alloys, fabrics and plastics. In times when these materials have to be taken largely for war, it is still possible to fill many of our needs by reverting to basic raw materials. One of these is cellulose obtained as a fiber from all plants and significantly produced by nature from the earth with the aid of moisture, air, and solar energy. While the demand for paper pulps has greatly increased, there can be no real shortage of this material. There may be a lack of labor for bringing in wood for pulping; however, this situation can be alleviated by the current program for collecting our waste paper. The great loss caused by uncontrolled forest fires is a factor that should cause concern to everyone, yet we should realize that throughout the country countless fires are deliberately destroying more than is being saved for conversion into paper pulp.

Types of Technological Problems

There are two general types of technological problems connected with the development of new paperboard products. One is concerned with finding solutions for the more immediate demands upon the paperboard industry. These are the natural applications in which the paper should be improved in some particular quality. A second type of problem, which is quite important, involves the making of paperboard fitted for some special purpose which has been newly created. The paperboard manufacturers have been accustomed to supplying paper in rolls and sheets of standard quality, and have had little occasion to explore the possibilities for new uses of their product. Those who are working in metals and plastics often do not know of the advantages that can be obtained through the use of paper.

The "Proofing" Processes

Waterproofing, vaporproofing, weatherproofing, greaseproofing, moldproofing, termiteproofing, fireproofing and many other qualities can be developed in paperboard. The term "proof" implies a degree of certainty which in the processing of paper is often difficult to obtain. A mothproofed garment is effectively protected for a season; a bulletproof vest stops bullets; but a greaseproof paper, for example, in some cases will hold grease for a much shorter time than we would like.

Many of our technological problems center around the making of paperboards which will better meet special requirements. These problems are being handled successfully even with the limitations on certain materials. Waterproofing usually requires a complete treatment of the pulp before it is formed into paper. In making hard-sized board, wood rosin and wax emulsions are coagulated upon the fibers by alum. These materials should remain available, although other acidifiers may have to be used to replace part of the alum. A waterproof coating is often applied to paper in the form of hot wax. One type of board which presents some manufacturing difficulty must be made so the penetration of an approved wax at 185 Fahr. shall be 65 per cent in 25 seconds. The well known microcrystalline wax used in vaporproofing will have to be replaced with various wax blends and heavy petrolatums. Special asphalts are being formulated to meet the temperature extremes encountered in export shipments. Treatments against fungus, mold and termites are toxic chemicals such as copper naphthenate, chlorinated phenol, or mercury compounds. Greaseproofing with silicate of soda or certain hard waxes is ample for many purposes and there are any number of effective treatments which can be used where the type of product will permit more expensive coatings. Varnishes, casein solutions, soluble celluloses, lacquers, nitrated starches, and many of the new synthetic resins are greaseproof.

Fireproofing is accomplished through the use of two general classes of chemicals having characteristic actions when heated. One type of chemical forms a glazed coating over the fiber when heated and this seals it away from the air needed for combustion. Such compounds are often borates, phosphates or silicates. The second type of chemical produces a gas when heated. These are often ammonia compounds such as ammonium sulphate, urea, sulphamic acid; or they may be chlorinated compounds such as chlorinated benzene or chlorinated paraffin. Since most of these fireproofing treatments are made by passing the paper through water solutions, it is clear that the paper must be very absorbent and that a drying operation will be necessary to finish the process.

Typical Needed Developments

Those developments having the most promising commercial value, for obvious reasons seldom will be publi-

cized until the products have appeared on the market. This is not very helpful to those in the industry seeking to do more in the war effort; and yet it is not a serious handicap. Each mill and each box making plant will have to study its own equipment before deciding what new developments can be undertaken. Then a little imagination can be applied in selecting suitable problems.

It has been observed that a weatherproof box may stand extreme weather conditions very nicely, yet the contents may be of a kind that will be harmed. Few paperboard containers are made airtight. The waterproof tape sealing method is somewhat successful, but is not the best solution for this problem.

During the present shortage of all kinds of shipping containers, there is an opportunity for someone to make a new type of box, one which may have stitching at necessary points, yet so designed that a retail store can easily unfold the box when empty and without damage fold it into a flat, compact form which will permit it to be returned for re-use.

Small paper cans have been commonly used for spices, soap powder and similar products. Recently paper cans have been made to hold oil and paints by winding multiple plies each held with a special adhesive. There is still need for a better method of fitting strong paperboard ends on these cans.

Air transportation is increasing in volume and will require light weight paper containers. An "Air-freight" container designed to make easier the extra handling involved would be welcomed. Frozen foods are now shipped in multiple walled corrugated boxes. It is suggested that some perishable foods can be refrigerated and possibly frozen in transit by planes traveling at high altitudes.

Heavier weights are being carried in paperboard and as this trend continues, boxes will be made correspondingly stronger. It seems probable that in the future a paperboard will be produced having unusual stiffness, yet capable of being temporarily softened so that it can be scored easily. Some work in this direction has already been done using thermoplastic loading materials.

Ammunition containers require a paperboard that is non-tarnishing to copper and brass. Specially prepared pulps are not available in the amounts needed, and it is therefore necessary to carefully select the best paperboards. A simplified tarnishing test using brass plates has greatly aided in the evaluation of these boards. It is of course true that regular wax impregnation improves the non-tarnishing qualities; however, there remains a need for an effective inhibitor which can be added to any paperboard to make it reasonably nontarnishing.

Comments on Some Common Mill Problems

Papermakers are constantly learning new chemical terms which they come to use with considerable frequency even when unaware of their full meaning. We have diatoms, fatty acids, hysteresis effects, catalysts, *p*H values and many others. Sometimes these technical terms are used in attempts to impose upon us ideas of doubtful value. In one instance a consulting engineer claimed to have a catalyst for increasing the action of cooking liquor in a digester. When a small jar of the white powder was emptied into a large tank of caustic liquor, one of the cookers exclaimed, "Is that all it takes? . . . Listen to it sizzle"! The next morning in reporting the results he said, "That must be powerful stuff. Last night I coughed up a lot of green phlegm"! Yet an analysis of the powerful catalyst revealed that it was nothing more than alum with a small amount of another relatively harmless chemical sold in all drug stores.

Sometimes technical genius is lavished upon problems which in their very nature are almost beyond solution, and occasionally there is great excitement over some problem which is not serious enough to require much attention. Slime preventatives can be used with assurance of success in mills making fine papers, but the boxboard mill with its system carrying waste paper pulps presents a problem that few slime preventatives can handle. Some talent has been used in devising foam killers in the belief that foam is always undesirable. Some of these products in concentrated form would have an appeal if priced in line with their performance. Wetting agents are becoming numerous and considerable effort is being made to find uses for them in the paper mill. They do perform wonders in de-inking and when used in adhesives and paper coatings. Many suppliers of materials for papermaking have a misconception of what can successfuly be used in the beaters. Coarse fillers and pigments are likely to be lost in the machine water and not retained in the finished paper. There are often suggestions made for calender treatments with claims that the Mullen test will be raised or some other remarkable improvement made. Calendering is however an excellent method for improving finish and for tinting lined boards. An error which nullifies the value of many a report on pulp preparation comes in assuming that the results from small scale experiments will apply in terms of quality, yield and chemical costs when calculated for full scale production.

Sources of Information on New Developments

The Technical Association of the Pulp and Paper Industry is leading the field as a clearing house for developments related to the war effort. TAPPI bulletins, standards and data sheets are exceedingly helpful. Government publications contain the reresults of fine research work carried on in laboratories such as those at Forest Products Laboratory, the Bureau of Agriculture's Regional Research Laboratories and the Bureau of Standards. The U. S. patent gazettes contain much information. The Institute of Paper Chemistry has a capable staff which contributes many original ideas. Publications of the American Chemical Society fill a particular need for details on new processes. Many new developments are released in advertising folders, industrial bulletins, news letters, and digests. Business papers serving the pulp and papermaking industry contain departments which supply information on every phase of paperboard production.

Research Methods

One can make the rather simple observation that all discoveries of a technical nature are made in the laboratory, or in some other auspicious surroundings. It may be surprising to find that while the perfecting of an idea is usually carried out with special equipment in the laboratory, the actual discoveries (those of most value because of their simplicity) often require no equipment of a tangible nature. The inventor merely draws upon whatever information and experience he may possess. While thought is practically instantaneous, a worthwhile idea may be the result of many hours of study and perhaps a little "doodling" and day dreaming. Developments of a more subtle nature involve refinements of the same method, in which there is a thorough search made through all the literature on a particular subject. The numerous facts are noted, some logical deductions made, and a series of laboratory tests outlined. Experiments may then lead to a successful process on which a complete new business can be built. Naturally, special interest is taken in processes which will be of permanent value. Some items now being made specifically for military use will later on prove very valuable for civilian use. The paperboard industry is today going forward in a progressive spirit of which we may be justly proud.

Paper Mill Replaces Steam Engines *with* Adjustable Steam Turbine Drives

E. A. DUNTON, Chief Engineer
Sutherland Paper Company

▸▸▸ OPERATING EXPERIENCE over the past months has shown that the application of two adjustable speed steam turbine drives replacing steam engines on board machines at the Sutherland Paper Company has provided a saving of close to two per cent of the total steam generated. These two new units, connected directly into the line shaft, maintain close speed regulation in spite of variations in load, inlet pressure, and exhaust pressure.

When it became necessary to replace the two obsolete steam engines, a check was made to see if steam turbines could be substituted without material change in the heat balance of the mill. Several large turbines in the main powerhouse provide electric power to the mill and steam for the various processes. It would have been possible to obtain more kilowatts per pound of steam had the steam going through the engines been put through the main powerhouse turbine. However, since the capacity of these main power turbines was limited and they were providing all the kw possible under their designed condition, it was found that steam turbines could be applied in place of the steam engines without materially altering the overall heat balance.

The space for fitting the turbines was limited by pillars and steam and water pipes. The several layout arrangements available, however, made it possible to place the turbines in position without difficulty. Two single-stage Westinghouse turbines were chosen, each operating on a different set of steam conditions. Both are rated at 350 hp., with a maximum turbine speed of 5300 rpm and a corresponding gear speed of 400 rpm. One is designed for 265 lb. pressure, 600 degrees total temperature, 20 lb. back pressure, and is coupled into the center of the variable speed lineshaft. The other is designed for 200 lb. initial pressure, 525 degrees total temperature, 23 lb. back pressure and is coupled to one end of the variable speed shaft.

With a suitably designed turbine, a much better heat balance could be worked out with the other steam equipment already installed in the plant. Heat balance actually means coal saved, or in other words, the amount of coal required per pound of paper. In this installation, the adjustable speed turbine machines have produced a saving in steam generated of two per cent. Maintenance costs have been reduced with the elimination of belts, pulleys and bearings previously required for the steam engine drives.

The most important feature on any paper machine drive, either electrical or steam, is accurate speed regulation under all conditions. Such regulation has been provided on these turbines with a governor of the centrifugal-weight, oil-relay type that is capable of operation over a speed range of 25 to 1. Although this wide a range was not required, it made it possible to apply the turbine to our board machines without concern over the availability of a speed range to suit our particular requirements. The steady speed that has been obtained on the machines can be accounted for in part by the fact that the governor is not affected by variations in oil temperatures.

This governor consists essentially of four elements:

1) A separate motor-driven pump that supplies oil for governing and lubrication at constant pressure, independent of the turbine speed.

2) A pair of governor weights secured to a spring steel strap mounted

Centrifugal-weight, oil relay governor on steam turbine drive is capable of operating over a speed range of 25 to 1. Close speed regulation provided has insured a good, even sheet and a uniform caliper.

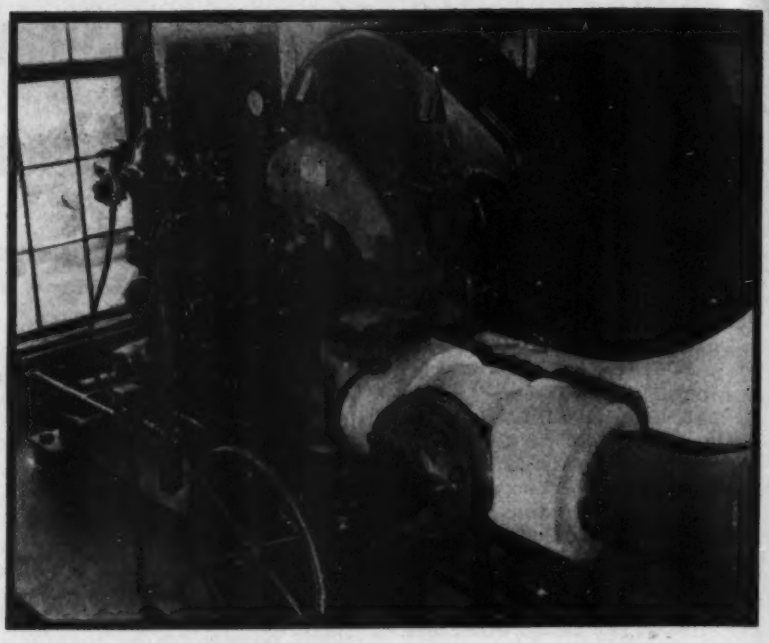
across the governor hub and gear driven from the turbine rotor shaft.

3) A cup valve that is positioned by the centrifugal force of the governor weights. The governing oil pressure is established by varying the opening between this cup valve and its seat.

4) A servo-motor that opens or closes the steam admission valve in response to governing oil pressure changes.

If the turbine speed should increase, for example, the centrifugal force of the governor weights moves the cup valve upward against the downward force of the governor spring and the governing oil pressure. This decreases the flow to drain, and increases the governing oil pressure until the new downward force balances the increased centrifugal force of the governor weights. The increased governing pressure thus established is communicated to the top of the servo-motor relay. This moves the servo-motor relay downward, draining high pressure oil from below the servo-motor piston and closes the governing valve as required.

The speed can be varied by a hand-operated, or motor-operated speed changer that consists of a worm and wheel that is threaded on the cup valve housing and acts directly on the governor spring. The wheel forms the upper support for the governor spring so that its downward movement increases the governor spring compression and hence the turbine speed. The upward movement has the opposite effect.



Installation view of a Westinghouse 350-hp., single-stage, adjustable speed turbine coupled into the center of the variable speed line shaft turbine drive on a board machine at the Sutherland Paper Company. Attention and maintenance required for belts and pulleys on the previously installed steam engines has been eliminated.

The turbine is put into operation by starting the motor-driven oil pump and opening the steam supply valve. It is shut down by closing the steam supply valve. In an emergency, remote stopping of the motor-driven oil pump causes the low oil pressure trip mechanism to close both the separate overspeed trip valve and the governing valve simultaneously.

Repair Shop of Small or Medium-sized Paper Mill

H. M. GRASSELT

▸▸▸ THE IMPORTANCE OF a well-functioning repair shop or maintenance department has been forcibly impressed upon the small or medium-sized paper mill by the War with its incident shortage of essential materials and difficulties in getting machinery, tools, spare parts, and sundry supplies. The small or medium-sized mill is considered as having from one to three paper machines and a daily production of up to thirty tons of sulphite or rag content papers.

In a mill of this kind, the repair shop may be under the supervision of a master mechanic or a boss millwright. In many instances, he is a skilled mechanic who has come up through the ranks. However, practical skill and the ability to operate various machine tools of themselves will not make a successful executive. To fill the job satisfactorily requires an exceptional man.

All of the equipment in the mill is entrusted to him. If it is in poor condition, both production and quality will suffer. The number of employees in the repair shop will depend on the size of the mill, its layout, and the physical condition of machinery and equipment. Furthermore, the location of the mill has a bearing on the required number of skilled mechanics. A mill, located in an isolated community perhaps miles from a large town, should have a maintenance crew with ability to handle any repair job. It is only in this way that the mill in an emergency, can prevent undue losses because of delay in obtaining skilled men from outside.

Operations in the repair shop must be carried out by expert workmen. Saving a few dollars a week on wages by hiring inexperienced and unskilled help to do maintenance work is false economy. The crew should include several millwrights, a carpenter, a blacksmith, a pipe fitter, an oiler, an electrician, and several helpers.

In many cases, the chief electrician is responsible to the superintendent or mill manager rather than to the master mechanic. Whenever the responsibility is so placed to minimize function between the two departments, it is necessary to clearly define the duties of the master mechanic and the chief electrician. Similarly, relations between the chief engineer of the power plant, master mechanic, and chief electrician, must be definitely understood.

Now and then, in spite of rigid lines of responsibility, certain contingencies arise which require deviations of set rules. In such instances, the individual authority must be subordinated to

the benefit of the entire organization.

Even in a mill where the chief electrician and the chief engineer are members of the maintenance department and responsible to the master mechanic, the scope of their respective responsibilities should be established and understood. Briefly, the responsibilities of the three men may be somewhat as follows:

Master mechanic — installation of new machinery and equipment, repairs and improvements on such machines, shafting, belts, elevators, etc., and oiling.

Chief electrician — installation of new electrical equipment, motors, generators, wiring, etc.

Chief engineer—power plant, boilers, steam engines, condensers, air compressors, valves, heating, etc.

There are many logical subdivisions within these several departments. A chart illustrating the responsibilities of the individual department will help to definitely establish the proper lines of authority.

Repair Shop Duties

Among the functions and duties of the repair shop are:

1) Keep plant and equipment in condition to produce most economically.

2) Plan and execute work so that mill can operate without, or at least with a minimum, of preventable shutdowns.

3) Prepare for repair work, changes and installation in advance so that work can be done at a given time without delay.

4) Train crew to act effectively in emergencies. On such occasions, a well-organized and trained crew can demonstrate its skill and effectiveness as an economical factor in the mill organization.

5) Introduce periodical inspections —including investigations of fire prevention arrangements and sanitary conditions. Many losses originate from lack of rigid inspections.

Scheduling Work

Breakdowns and accidents, to a certain extent, influence the character and execution of maintenance work, but, nevertheless, repair work can be planned ahead with practicability.

A repair shop schedule can be made more effective if short meetings are scheduled weekly for all department heads. The various foremen, either before or during these meetings, should submit a list of jobs that should be done during the ensuing week. The list should designate the jobs which have to be done at once and those which can be done within a reasonable time and according to regular routine. Each list should be prepared in triplicate on a Request for Repairs form. One copy should be given to the superintendent; one to the maintenance department; and the third copy should be retained by the foreman as a record and for use as a follow up, if necessary.

Plant inspection, made for detecting wear and impending breakdowns, must depend upon the physical condition of the plant and equipment. A definite time should be set aside for doing this work; and the inspection should be made entirely independent from the report of the foreman requesting repairs.

The working schedule of the maintenance department should allow time for miscellaneous routine work as well as for preparation for large jobs and improvements.

Oiling and Greasing

Accidents, machinery breakdowns, and too rapid deterioration of equipment, may result from poor housekeeping, improper oiling, and poor repairing.

The oiler must thoroughly understand his duties. Merely oiling machines, shafts, etc., or putting grease into cups, will not suffice. He must be continuously on the lookout for wear and defects, wornout bearings, etc. Parts of machines and equipment where oils are used must be examined frequently and must be kept clean.

It is poor economy to buy cheap oils and greases. Only the best lubricants should be used as their better performance will more than compensate for the higher prices paid for them.

Preparation for Repair Work

Any extensive repair job or important improvement should be done in close co-operation with the manufacturing department. This procedure is necessary in order to conform to the running schedule and to promises made to customers on deliveries of paper.

All or most arrangements for repair work can be made in advance. Equipment and major supplies needed for the job can be placed conveniently before work starts; and miscellaneous supplies and tools can be held ready for immediate use when the work begins.

Shutdowns caused by low water in extremely dry summers, lack of orders, etc., afford splendid opportunities for doing such work, for painting, and for general housecleaning.

Much paper mill repair work, of necessity, has to be done on Sundays or holidays; but a carefully prepared and executed schedule of repair shop activities will substantially reduce such overtime work. Not only is overtime expensive, it also is very often the result of poor planning.

Repair work, like the work of any other operating department, can be put under production control. A bulletin board or control board, probably located in the office of the master mechanic, can be used to show planned routine—in other words, the job schedule of the repair crew for a definite period. Ordinarily, a weekly schedule is sufficient to insure well regulated activities.

Salvage

Careful attention should be given to scrap materials. Aside from the patriotic duty, the salvage of scrap metal, even in a small plant, is worthwhile from a dollars and cents standpoint. A corner partitioned off in the repair shop, or some other space in the mill, makes a satisfactory depository for scrap iron and other waste metals that cannot be reclaimed for mill use.

Records

The time of the master mechanic is too valuable to be spent on clerical routine. It can be utilized to better advantage in supervision and practical shop management.

Even a small mill will profit by having a shop clerk to take care of work involving the receiving and issuing of materials and supplies, to keep inventory records, to check time and to do other "paper work". The salary paid such a clerk will be more than repaid by better records and by better control of supplies and labor. Without such control, proper distribution of repair and maintenance costs are impossible, and there is unnecessary waste.

Systematic control of general supplies, like a perpetual inventory of raw materials and finished paper in stock, is a means of keeping a well-balanced supply on hand. It also tends to promote carefulness and economy, thus reducing the tendency of excessive buying with the resultant tieing up of funds that might be used elsewhere to better advantage.

An accurate physical inventory must precede the installation of a store's inventory record. The record, which can be kept on standard size filing cards, should contain a notation as to minimum and maximum of stock desired. This notation is to prevent overstocking or shortage.

The usual supplies should be arranged neatly in bins and on shelves. Articles of length, like pipe, etc., should be placed on racks. All supplies should be tagged or labeled for quick identification.

Entries on stock cards should be made from the receiving reports. The maintenance department also should receive a duplicate of each invoice involving maintenance supplies. This information is needed for requisitions on stores.

Each requisition on stores should furnish information on the number of items required for the job covered by the requisition. This information is retained by the shop clerk and used for inventory records.

It would be a waste of time and effort to requisition a machine screw or half a dozen nails. Such supplies, aside from sizes, are best entered by weight and checked by weighing at inventory time. The quantities used by each department can be estimated and the individual department charged on this basis.

There also should be a record of spare parts, such as pulleys, gears, pieces of equipment, etc. Each item should be tagged with a number, description and character of the piece and listed accordingly. Whenever an item of this kind is used, the shop clerk should retain the tag.

Before listing spare parts as assets, unless the items are new, they should be checked. Frequently, mills with accumulations of such items find upon investigation that many of them are scrap material and not salvageable.

The maintenance department also should have a complete record of machinery and equipment. The record should furnish a complete history of each item.

There are many ways in which such a record will prove of great value. Not infrequently, a new part will be needed for a machine that has been in use for a number of years. Perhaps, identification marks, name of manufacturer, etc., have been obliterated. In such a case, a complete record will furnish necessary details and thus avoid confusion and delay.

A record of this kind should show the original cost, amount spent for improvements, and repairs, and the annual depreciation charges.

Another important record to be kept is the inspection report. The master mechanic should prepare such a report for each piece of machinery he inspects. Each report should show department, machine or equipment number, day of inspection and work to be performed.

Supplementary to such a record should be kept a case history of every breakdown furnishing information on origin of breakdown and nature of repair required; and supplying suggestions on how to prevent a repetition of the breakdown.

Practical repair shop work is divided into job orders and standing jobs.

Job orders originate in the office, and are issued whenever a new piece of machinery is purchased or improvements authorized. They constitute an increase to the value of the plant.

The front side of a job order filing card should contain a description of the job, the estimated cost, and other details. The reverse side might be ruled for entry of labor and materials. Any materials purchased specifically for a job and not used, must be transferred to regular inventory and credited to the job.

At the completion of a job, the job order card represents an accurate and comprehensive record of the equipment installation covered by it.

Standing job orders cover minor repairs and are charged individually to the respective piece of equipment or department.

In recording data of this kind, a series of symbols may be used to identify machine parts which may require repairs from time to time.

Labor Cost

With the expenditure for labor itemized according to departments and units, mill management, at least to a certain extent, can control maintenance expenses. Rising maintenance costs are danger signs which call for prompt attention.

Repair shop work may be controlled with job tickets. Such a ticket reveals the date, job order number, description of work, time of starting work, time of stopping work and other necessary details to permit comprehensive control of labor costs. The time recorded on a ticket or tickets must conform to the time shown on regular time card of employee or employees scheduled on the job.

Budgeting Maintenance Expenditures

To better control activities and expenditures of the maintenance department, a budgetary control should be established for it as an integral part of the general budget. The control may be divided as follows: (1) repairs; (2) replacements; (3) improvements; and (4) additions.

Repairs are current expenses required to keep plant in best possible condition. Since cost figures for labor and materials are entered in the control accounts, the management is in position to set up fairly accurate estimates permitting actual costs to be checked against budget figures.

Whenever actual figures and estimated cost figures show too great a difference, a thorough investigation should be made. An abnormal rise in expenses may be due to a decrease in efficiency, to a rapid deterioration of machinery and to other causes.

Tools

Tools represent a considerable investment and should be handled with care. A well-arranged tool storage will help to avoid delays. Such tools should be in charge of the shop clerk and they should be returned to the storeroom at the end of a job or at the close of a day.

Mills with high maintenance and repair costs often have greatest indirect losses. The most effective means of reducing such losses are proper inspection and maintenance of equipment in good operating condition.

Oftentimes, equipment costs are considerably increased by overspeeding, overloading, or by other adverse operating conditions. Slipshod work as well as the buying of inferior equipment and supplies also may result in an increase of direct and indirect repair and maintenance costs.

The ultimate aim of the maintenance department should be higher efficiency and lower costs; in other words, more economic operation.

◆

Purpose of Job Training

The real purpose of job training is *to get a man to do a job the way it should be done.*

Job training is not complete, nor is it effective, until a man knows *what* to do, *how* to do it, and the *reasons* for doing it the way he is instructed.

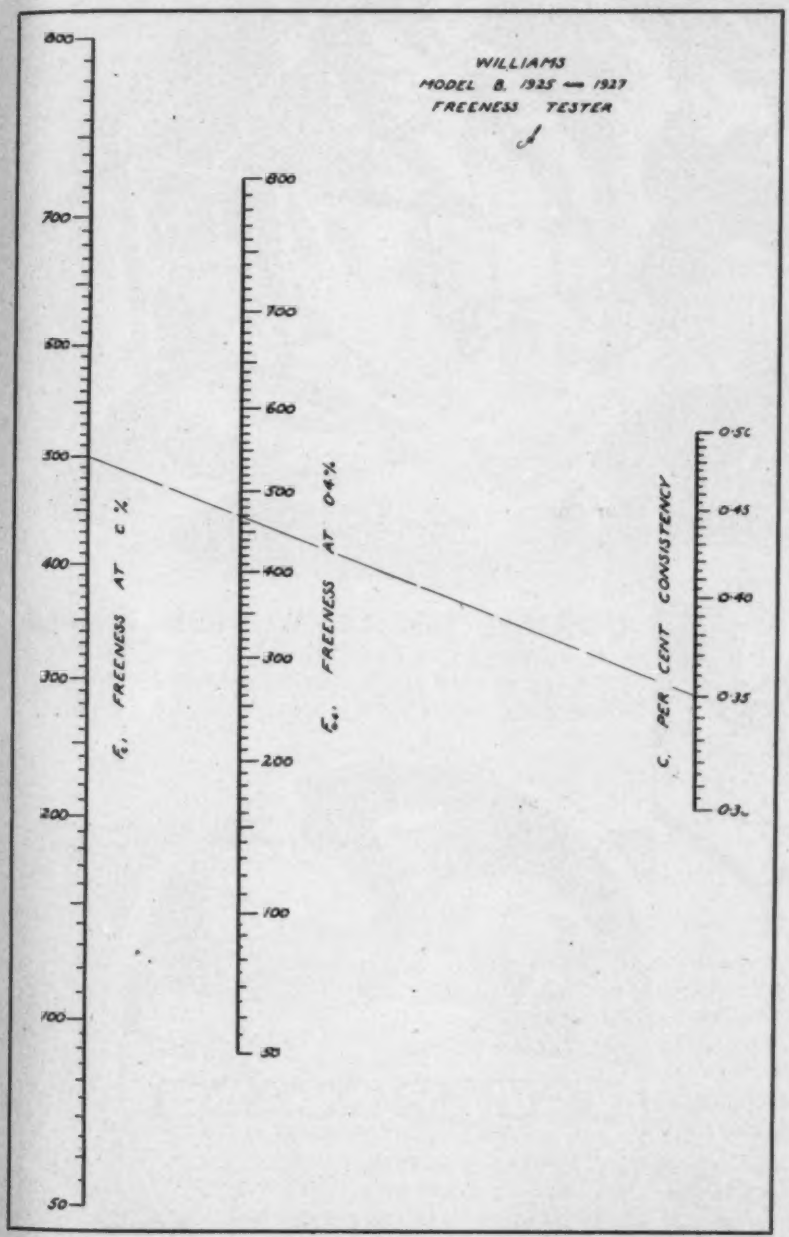
Training is an inseparable part of production. You may have the finest equipment in the world. You may have employees available to assign to that equipment. But if they have not been trained to operate it properly, the best results will be lacking.

The supervisor who says he is "too busy to train men" is really saying that he is too busy to get the work out right. Training instruction is really a part of supervision. A supervisor cannot supervise, except by instructing men properly.

After the original instructions have been given to a man or woman, and the supervisor is satisfied that the worker knows how to perform the operation correctly, there must be still some thorough follow-up on the part of the supervisor. He should observe the worker frequently. He should have an understanding with the worker so the worker knows to whom to turn for further help. Nothing should be left to chance.— *Management Information,* published by Elliott Service Co., Inc.

Nomographic Correction Chart
for the Williams Model B Freeness Tester

D. S. DAVIS, Wyandotte Chemicals Corporation



▸▸▸ NOMOGRAPHIC FREENESS correction charts have been prepared for use with both the Schopper-Riegler beating tester (*1*) and the Canadian standard freeness tester (*2*). It is the purpose of this paper to present a similar alignment chart covering consistency corrections in the case of the Williams Model B (1925 and 1927) (*3, 4*) freeness testers.

Starting with the general equation (*3*) connecting the freeness, F, in cubic centimeters with the bone-dry consistency, c, in per cent,

$$\frac{1000}{F} = K c + 1.081$$

it can be shown that the freeness, $F_{0.4}$, at the standard consistency of 0.4 per cent is given by the expression,

$$F_{0.4} = \frac{1000}{\frac{0.4}{c}\left(\frac{1000}{F_c} - 1.081\right) + 1.081}$$

where F_c is the freeness at a consistency of c per cent.

This latter equation may be solved readily and accurately by means of the accompanying logarithmic alignment chart which was constructed by methods described previously (*5*).

The use of the chart is illustrated as follows: Given a freeness of 500 cc. determined at a consistency of 0.35 per cent. What is the freeness at the standard consistency of 0.4 per cent? A straight line connecting 500 on the F_c scale with 0.35 on the c scale will cut the $F_{0.4}$ scale in the desired value, 470 cc.

Literature Cited

(1) Davis, D. S., *Paper Mill*, 54, No. 15, 30 (1931); *Pulp and Paper Mag. Can.*, 31, 911 (1931).
(2) *Idem, Pulp and Paper Mag. Can.*, 31, 586 (1931); *Paper Makers' Monthly J.*, 69, 241 (1931).
(3) *Idem, Ind. Eng. Chem.*, 18, 631 (1926).
(4) *Idem, Pulp and Paper Mag. Can.*, 26, 1055 (1931).
(5) *Idem*, "Empirical Equations and Nomography," 1st ed., p. 104, McGraw-Hill Book Co., New York, 1943.

There is probably no other industry in the country that touches as many phases of human endeavor as the chemical industry. Under all probability, the chemists and physicists contribute basically more toward winning a war than any other group. . . . More than that, in these United States, you cannot find a scientist who is rightfully entitled to the name, who ever wanted war—he is too well aware of the consequences.—Dr. Willard H. Dow (quoted from "Rediscover the Rainbow," address given by Dr. Dow when he was awarded the 1943 Chandler Medal.)

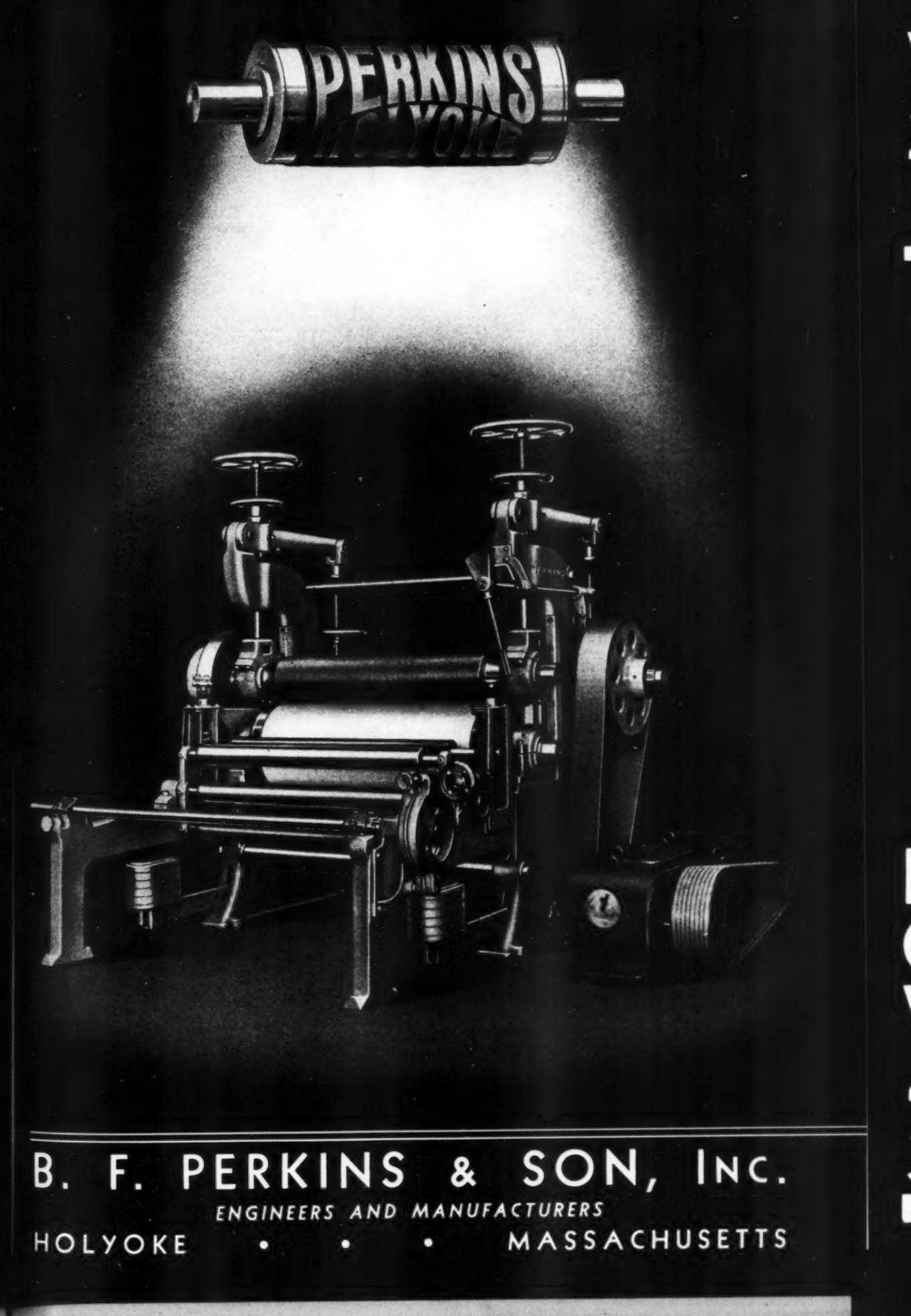
PAPER SKETCHES

DURING THE REVOLUTIONARY WAR, THE DEMAND FOR PAPER WAS SO GREAT IN THIS COUNTRY THAT SHEETS OFTEN WERE TAKEN FROM A MILL BEFORE THEY WERE SIZED OR DRY.

PAPER MADE IN GERMANY DURING THE EARLY 1200'S, PURPORTEDLY WAS OF SUCH POOR QUALITY THAT FREDERICK II, THEN EMPEROR, ORDERED THAT ALL PUBLIC ACTS SET DOWN ON PAPER SHOULD BE TRANSCRIBED UPON PARCHMENT.

PAPER MADE IN ENGLAND ABOUT 1806 UPON FOURDRINIER MACHINES WAS CAREFULLY EXAMINED BY MEN FROM THE EXCISE OFFICE BEFORE LEAVING THE MILLS.

6,500,000 POUNDS OF PAPER WERE REQUIRED BY THE U.S. GOVERNMENT PRINTING OFFICE IN THE PRINTING OF CAMPAIGN MATERIAL FOR THE THIRD WAR LOAN PROGRAM.



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ELWELL-PARKER MARKS ITS GOLDEN ANNIVERSARY

The Elwell-Parker Electric Company is observing its 50th anniversary this year. Company executives point out that 1943 is also a milestone for the entire industry because Elwell-Parker was the first builder of power industrial trucks.

Organized in 1893, Elwell-Parker several years later supplied electric motors which the Pennsylvania Railroad installed on its first crude baggage-handlers at Jersey City and other terminals. Later, the Cleveland company began building mobile truck equipment, and, after 1910, other firms entered the field. The expansion of the power truck industry to its present important place is the result of close co-operation between plant officials desirous of improving their methods of material-handling, and the truck manufacturers' own design engineers.

Although Elwell-Parker has been in existence continuously for 50 years, its corporate history begins with the birth in 1843 of Thomas Parker, one of the founders of the electrical industry in Great Britain. The old firm of Elwell-Parker Ltd. made motors and dynamos in Wolverhampton, England, and in 1893 licensed a separate company to build them in America. In its early years, the development of the American company was influenced in several ways by Charles Francis Brush, of Cleveland, inventor of the arc lamp and the storage battery, and by other distinguished pioneers of that period.

For some time after 1893, the entire output went to the old Brown Hoisting Machinery Company for use on its ore-handling equipment much of which is operating today. Later the company supplied motors for electrical street vehicles, both passenger and commercial. Early in the 1900's the American Elwell-Parker interest bought out the British holdings and for more than 30 years has concentrated on the development of interior trucks for industrial use.

◆

▶▶▶ THE MANUFACTURING PLANT and inventory of Link Belt Supply Company, Minneapolis, has been purchased by Link-Belt Company, Chicago. Since 1900, the Minneapolis concern has worked closely with Link-Belt Company as an authorized distributor of its products in Minneapolis, St. Paul and adjacent territory. Ray S. Wood has been appointed plant manager. The entire Minneapolis organization will be retained.

◆

BOOKS AND OFFSET LITHOGRAPHY SUBJECT OF TALK BY PORTER

H. A. Porter, vice president in charge of sales for the Harris-Seybold-Potter Company, Dayton, Ohio, recently addressed the Book Manufacturers Institute, Inc., on the subject of offset lithography.

Mr. Porter's address was premised on the future of the Graphic Arts and the part of offset lithography for book production in the postwar period. He stated that the first known book produced by lithography was printed over a hundred years ago, and that an exhibit of books by offset at The American Institute of Graphic Arts in New York last year brought 548 entries.

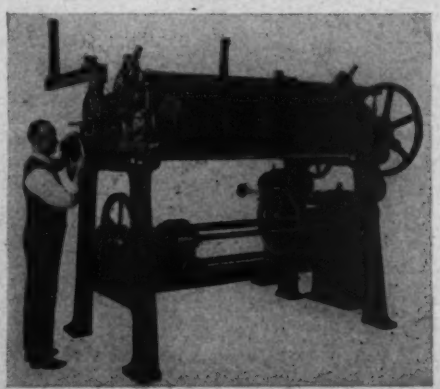
In retrospect, Mr. Porter gave a very interesting historical sketch of the first offset lithographic press built for paper, which was developed and

Since 1828 . . .

we have served the industry well, with the finest in Paper Mill Machinery.

Now . . .

our Engineering Department and entire manufacturing facilities are devoting every effort to turn out the mightiest and most formidable fighting machine our country has ever known. While we cannot give you typical peacetime S&W Service, we can supply you with replacements — under proper priority rating, of course.



ROTARY SPOT CUTTER—All anti-friction bearings—for cutting preprinted rolls of paper to mark—manual or automatic photoelectric control.

Other SW Products—Undercut Trimmers—Rainstorm Shower Pipes—Stuff Pumps—Bag Machinery—Jordans—Cylinder and Fourdrinier Machines.

THE SMITH & WINCHESTER Manufacturing Company

SOUTH WINDHAM ★ CONNECTICUT

STORE MORE ROLLS HANDLE THEM FASTER!

Rolls of various diameters and lengths, of hard kraft paper, corrugated board or soft napkin tissue, can be handled faster, easier and at lower cost, with a Cleveland Tramrail motor-driven roll grab and an overhead crane or rail system.

The cab operator, alone, can deliver rolls to and from storage, without leaving his cab. As he works and travels above the rolls, he is free of danger from falling rolls and is not hindered by floor obstructions. He can convey rolls directly to storage from paper machines, or if desirable, directly from storage to shipping, thus eliminating all time-consuming intermediate handling.

More rolls can be stored in a given area because no aisle space is needed and rolls can be piled on end 8 to 10 high. There is less spoilage because denting and crushing of corners is practically eliminated.

If you are among those alert executives who are making studies and preparing plans for the intensely competitive days ahead, we suggest that you consult our local representative, who will be glad to let you draw on his specialized experience without obligation.

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OVERHEAD MATERIALS HANDLING EQUIPMENT

shipped early in the twentieth century. One of the collaborators in the development of this press was C. G. Harris, of the Harris Automatic Press Company, of Niles, Ohio. This press, known as the Rubel press (so named for one of the founders) later became the Potter offset press, and eventually a part of the Harris-Seybold-Potter Company in 1927.

◆

▶▶▶ A SYNTHETIC RUBBER SPONGE is announced by The B. F. Goodrich Company, Akron, Ohio. It is an all-purpose sponge, made in three densities—soft, medium, and firm grades. Each has good oil resisting properties, and can be made into slabs, cord, tubing, or in almost any other molded shape.

◆

▶▶▶ A NEW PLANT has just been completed by the Cooper Alloy Foundry Company, Hillside, New Jersey. The company specializes in corrosion and heat resisting alloys, and the new plant increases its production with marked savings in cost, time of delivery and man-hours worked.

◆

PROMOTIONS ANNOUNCED BY LINK-BELT COMPANY

Edward J. Burnell, heretofore vice president and general manager in charge of Pershing Road plant operations and control division sales, has been transferred to the Executive Office of the company, 307 N. Michigan Ave., Chicago (1). In his new position Mr. Burnell will be vice president in charge of sales for the entire Link-Belt Company.

Directly assisting Mr. Burnell in his new post will be Nelson L. Davis, sales manager for materials handling machinery; William H. Kinkead, sales manager for power transmission machinery; and C. Walter Spalding, sales manager for power transmission equipment required by original-equipment manufacturers and duplicate machinery accounts.

Harold L. Hoefman, manager of the company's Atlanta (Ga.) plant, succeeds Mr. Burnell as general manager of the Link-Belt Pershing Road plant in Chicago.

Richard B. Holmes, district manager at Indianapolis (Ind.), has been appointed manager of the Atlanta plant to succeed Mr. Hoefman.

David E. Davidson, district engineer at the company's Detroit office, has been named district manager at Indianapolis, to succeed Mr. Holmes.

Edward J. Burnell

ARMY-NAVY "E" AWARDS

"E" Pennant

Hercules Powder Company, Mansfield, Massachusetts — The presentation of the "E" pennant to the employees of this Hercules plant on October 28, added another award to the growing list of the company's plants to be so honored (Cf. P. I. & P. W. Oct., 1943, p. 768). The pennant was posted by a color guard from Camp Myles Standish, and was presented by Col. Frank O. Robinson from the same camp. Colonel Robinson is a former Mansfield resident. Dr. R. L. Marsh, technical director of the plant, received the pennant and representatives of the employees' groups accepted the "E" pins.

Link-Belt Company, Chicago — This company's Caldwell plant in Chicago was the fourth Link-Belt plant to receive the "E" award. Presentation ceremonies were held October 7. The Navy's citation for meritorious service was read by Lt. Commander V. C. Dreiske and the presentation address for the Army was delivered by Col. C. J. Otjen. G. Walter Ostrand, general manager of the plant, accepted the award for the company.

White Star

Mathieson Alkali Works, Inc., Niagara Falls, New York.

Farrel-Birmingham Company, Inc.— The Ansonia (Conn.), plant of this company has just been awarded the third renewal of the White Star. Each of the company's plants located at Ansonia and Derby, Conn., and Buffalo, New York, now flies the Army-Navy "E" with three white stars.

(The pennant is for excellence and meritorious service. Each white star denotes six months of continued excellence.)

▶▶▶ THE START OF VOLUME PRODUCTION of industrial belting made with synthetic rubber has been announced by the U. S. Rubber Company at its plant in Passaic, New Jersey. Cotton fabric which forms the base of the product is made in various weights at the textile plants of the company and shipped to the Passaic plant for processing.

ASSOCIATIONS

NAM ANNOUNCES ITS SECOND WAR CONGRESS

The Second War Congress of American Industry — the forty-eighth annual convention of the National Association of Manufacturers — will be held December 8, 9 and 10 at the Waldorf Astoria Hotel, New York City.

In view of the many vital problems which all industry must consider at this time, the forthcoming NAM Congress will have as its theme "Production for Victory and Postwar Jobs." Frederick C. Crawford, president of the Association, has announced four headline speakers who have been scheduled. They are: Donald M. Nelson, chairman of WPB; Joseph D. Eastman, director of ODT; Wilfred Sykes, president of Inland Steel Company, and Tom M. Girdler, chairman of the board of Consolidated-Vultee Aircraft Corporation and chairman of Republic Steel Corporation.

◆

CONVENTIONS AND COMING EVENTS

Nov. 18-19—Annual meeting, National Paperboard Ass'n, Waldorf-Astoria Hotel, New York, N. Y.

Dec. 6-11—19th Exposition of Chemical Industries, Madison Square Garden, New York City.

Dec. 8-10—48th Annual convention of the National Association of Manufacturers, Waldorf-Astoria Hotel, New York, N. Y.

STATED MEETINGS

Technical Association of the Pulp and Paper Industry

Delaware Valley Section—First Friday of each month at the Engineers' Club, Philadelphia, Pa.

Kalamazoo Valley Section—First Thursday of each month, including June, at 6:30 P. M. at the Columbia Hotel, Kalamazoo, Mich.

Lakes States Section—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

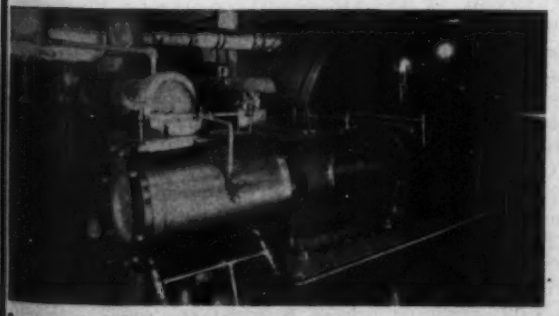
New England Section—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Steam engine indication is one method used by Standard Oil Engineers to bring back engine power.

During twelve years of normal operation a Corliss engine in a dry products plant gradually lost its pep—steam consumption also became excessive. The owner reports: "The engine was indicated and checked by your engineers, who recommended that several adjustments be made. We followed these suggestions and the engine is now operating like a new unit. Such engineering and technical advice has been worth real money to us. We appreciate the fact that your cooperative engineering service made this improvement possible."

Sluggish operation under load variations troubled the operator of a Corliss engine in a large Minnesota grain elevator. The engine operated cleaning equipment and conveyors, and was subjected to heavy loads as the grain traveled through the elevator.

A Lubrication Engineer analyzed the problem—poor atomization of the oil, was his conclusion. With the oil he recommended, the engine responds quickly to load changes. Incidentally, rod packing life is doubled as a result of better atomization of the new oil.



Some engines like the 20-year-old one above have been kept at peak condition by regular consultation with a Standard Lubrication Engineer. Periodic indicator service and continuous use of cylinder and engine oils recommended by the Engineer have kept repairs low and power output high. No rings were replaced in the 20 years, and no cylinder reboring has been needed at this paper mill plant.

Making yesterday's steam plants meet *today's demands*

MANY STEAM ENGINES old enough to have served in the last World War are again carrying a large share of the power load in this one. In the years between, few of these engines, or those installed later, have been called upon to produce nearly their rated loads. Maintenance and lubricating practices have been geared to an easy-going peacetime schedule. Today's needs have changed the pace. Equipment now must give unfailing service at full capacity.

Standard Lubrication Engineers have already helped many plant men bring power production up to wartime needs. A few examples are cited here.

The solutions may seem simple in telling. But years of lubrication experience are behind every recommendation—years of study and research in refining and compounding to produce cylinder oil to meet specific plant needs—years of work by these Engineers on power plant lubricating problems.

See if one of them can help you. Call any Standard Oil Company (Indiana) office or write 910 S. Michigan Ave., Chicago 5, Ill., for the Engineer nearest you. In Nebraska, call any Standard Oil Company of Nebraska office.

Oil is Ammunition . . . Use it Wisely

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

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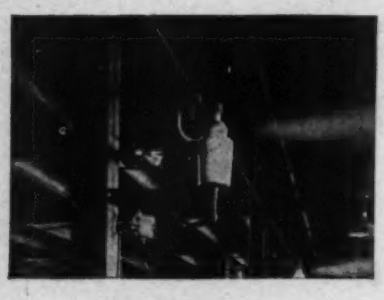
PREVENT
"DRY-OUT-ITIS"
due to winter heat



Armstrong HUMIDIFICATION

is widely used in the paper industry to cut costs and speed production

Used in paper cutting rooms, paper storage, sorting rooms, in waxed paper and decalcomania manufacture, etc. Armstrong HUMIDIFICATION keeps paper in workable condition, cuts static electricity, and removes other evils of dry air. Also used in offices to maintain healthful, comfortable working conditions, and to prevent winter colds.

Simple, practical, quiet; connected to steam lines like a unit heater. Fully guaranteed. Units as low as $100 for 40,000 cu. ft. Ask for literature and reports from users.

ARMSTRONG MACHINE WORKS

816 Hoffman St. Three Rivers, Mich.

WRITE FOR BULLETIN

AS LOW AS 2 CENTS PER HOUR!

BY THE MAKERS OF ARMSTRONG STEAM TRAPS

SAFETY

NSC ANNOUNCES NEW INDUSTRIAL DIVISION

The National Safety Council has announced the reorganization of its industrial safety engineering division. It is believed this change will provide more practical and specific assistance with accident and health problems in modern industry. This new plan makes full use of the industrial membership sections as centers for the accumulation and distribution of all safety information in their respective fields.

The goal of the new division will be to keep the Council's technical and practical information up to date so that it meets the needs of those who use it.

A safety engineer on the staff of the National Safety Council has been appointed as staff contact man for one or more of the industrial sections. He has been assigned in accordance with his experience and knowledge of the industries represented in the sections. The director of the new industrial division is J. M. Roche, well known to many members of the Paper and Pulp Section. Clarke D. Bridges is the staff engineer assigned to the paper and pulp, and petroleum industries.

◆

FIRST PAPER MILL TO WIN NATIONAL SECURITY AWARD

Following the first announcement of the National Security Award (Cf. P.I. and P.W. Oct., 1943, p. 767), the Office of Civilian Defense announced the formation of a Board of Review to pass final judgment on the protection and security records of plants nominated for the Award.

The Board is composed of delegated representatives of seven major labor, management, and safety organizations: Percy Bugbee, National Fire Protection Association; Paul L. Hardesty, Chamber of Commerce of the United States; R. E. Wilson, National Bureau for Industrial Protection; George J. Richardson, International Association of Fire Fighters (A.F.L.); Edward S. Webb, National Safety Council; Carl G. Goff, Brotherhood of Locomotive Firemen and Enginemen, and Thomas M. Brennan, National Association of Manufacturers.

Announcement has just been made that one of the first companies to receive this award is the West Virginia Pulp and Paper Company, Covington, Virginia, and this is the first paper company to be so honored.

SAFETY SCORES

▶▶▶ IN THE ANNUAL Paper Industry Safety Contest which began July 1, 1943, last reports received show thirty-five mills maintaining a perfect record. These mills are:

Division I—Pulp and Paper Mills

Group A—

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.

Group B—

Consolidated Paper Corp., Ltd., (Laurentide Div.), Grand'Mere, P. Q.
Wood Conversion Co., Cloquet, Minn.
United States Gypsum Co., Greenville Insulation Plant, Greenville, Miss.
St. Croix Paper Co., Woodland, Me.
Combined Locks Paper Co., Combined Locks, Wis.
***Quebec North Shore Paper Co., Baie Comeau, Saguenay, P. Q., Can.
**The Champion Paper & Fibre Co., Houston Div., Pasadena, Texas.

Group C—

Whiting Plover Paper Co., Stevens Point, Wis.
Strathmore Paper Co., Woronoco Mills.
Ontonagon Fibre Corp., Ontonagon, Mich.
Esleeck Manufacturing Co., Turners Falls, Mass.
*Certain-teed Products Corp., Niagara Falls, N. Y.

Group D—

United States Gypsum Co., Lisbon Falls, Me.
American Writing Paper Corp., (Parsons Div.), Holyoke, Mass.
United States Gypsum Co., Oakmont, Pa.
The Flintkoke Co., Little Ferry, N. Y.
Marathon Paper Mills Co., Ashland, Wis.
American Writing Paper Corp., (Nonotuck Div.), Holyoke, Mass.
**Central Fibre Products Co., Tama, Ia.
Rogers Fibre Co., Inc., Bar Mills, Me.
Spaulding Fibre Co., Inc., Milton Plant.
American Writing Paper Corp. (Mt. Tom Div.), Holyoke, Mass.
*American Asphalt Roof Corp., East St. Louis, Mo.
**Central Fibre Products Co., Vincennes, Ind.
International Paper Co., Riley, Me.

Division II—Paper and Board Remanufacturing

The Flintkoke Co., Rutherford Plant.
Bird & Son, Inc., Norwood Roofing Plant.
Lanzit Corrugated Box Co., Chicago, Ill.
Bird & Son, Inc., Chicago Roofing Plant.
Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.
Kimberly-Clark Corp., Atlas Mill.
Bird & Son, Inc., Shreveport Roofing Plant.
South West Box Co., Sand Springs, Okla.
Bay West Paper Co., Green Bay, Wis.

*July report missing.
**August report missing.
***September report missing.

The paper industry safety contest is conducted among member mills of the Paper and Pulp Section of the National Safety Council, and runs for twelve months. The present contest covers the period July 1, 1943, to June 30, 1944.

PLANNING WITH AN EYE TO THE FUTURE?

● As every mill operator well knows, the efficiency of pump equipment has a marked effect upon a mill's overall production efficiency. So—in shaping your plans for a new plant or re-equipping your present one—see to it that you install pumps that fit . . . Buffalo Pump engineers are prepared to bring you valuable operating data—help you coordinate tomorrow's pumps with tomorrow's manufacturing methods . . . There's a Buffalo Pump ideally designed for every type of liquid handling application, and embodying advanced ideas of design and construction. For details on Buffalo Pump engineering service, write:

ARMY E NAVY

BUFFALO PUMPS, INC.

213 Mortimer St. BUFFALO, N. Y.

Canada Pumps Ltd., Kitchener, Ont.

"Buffalo" PAPER STOCK PUMPS

NAMES *in the* NEWS

Personals

DR. CROXTON HAS NEW APPOINTMENT AT BATTELLE INST.

The appointment of Dr. Frank C. Croxton as supervisor of organic chemistry at Battelle Memorial Institute, Columbus, Ohio, has just been announced. This appointment is considered indicative of Battelle's extended activities in the field of chemistry during the past several years. Noteworthy accomplishments have resulted in the chemistry of plastics, lubricants, motor fuels, plasticizers for synthetic rubber, paints, lacquers, pulp and paper, and related fields.

Dr. Croxton has been a member of the Institute staff since 1939 in the capacity of assistant supervisor. Prior to that time, he was associated for nine years with the research laboratories of the Standard Oil Company (Indiana), Whiting, Indiana, where he was engaged in lubricating oil and catalytic cracking research. He is a member of the American Chemical Society. He is also a fellow of the American Association for the Advancement of Science.

◆

▶▶▶ *J. W. Allender* has returned to the United States and is now day superintendent of Moyer Pratt Company, Lyons Falls, New York. Mr. Allender recently returned from Peru, where he was superintendent of the mill at Supe, Peru, owned by W. R. Grace and Company, New York City. *Austen Fabey,* formerly with Algonquin Paper Company, Ogdensburg, New York, is night superintendent at Moyer Pratt Company.

◆

▶▶▶ The New York office of Bulkley, Dunton Pulp Company, Inc., announces that *Stephen Goerl,* formerly with Young and Rubicam will be in charge of advertising and publicity.

◆

▶▶▶ Among the overseas casualties to reach Montreal on October 16 was *Brigadier-General White,* D.S.O., E.D. A vice-president of Canadian International Paper Company and prominent in forestry and military circles in the Dominion, Brigadier-General White was called upon by Defense Minister Ralston to form the First Canadian Forestry Corps in August, 1940, and he proceeded overseas with that unit shortly after its formation. He has been in active service since the early months of the War, and was honored by the King who granted him the C.B.D. in July of 1942.

◆

JOSEPH TERBELL MADE FIRST V.P. OF AMSCO

In 1940, Joseph B. Terbell was appointed a vice president of the American Manganese Steel Division of the American Brake Shoe Company. He now has been designated as first vice president of that division.

Mr. Terbell joined the American Manganese Steel Division in 1928. He

Joseph B. Terbell

worked his way up from the Chicago Heights (Ill.) plant, through the Chicago sales office, and the St. Louis plant. After a brief period with the American Forge Division he returned to Amsco in 1937 as eastern sales manager.

◆

▶▶▶ The Gardner-Denver Company, Quincy, Illinois, has appointed *R. H. Rodolf* as manager of its pump and compressor division. In this position, Mr. Rodolf succeeds the late R. J. MacFarland. He has been assistant manager of the portable compressor and rock drill division of the company at Quincy since 1939. His assistant is *C. M. George,* who joined the organization in Quincy in 1929.

WALLACE K. BROWN IS MGR. N. Y. DIST. SALES CROCKER-WHEELER DIV.

Wallace K. Brown, former vice president in charge of procurements for the Crocker-Wheeler Electric Manufacturing Company, has been made manager of the New York district sales of the Crocker-Wheeler Division of the Joshua Hendy Iron Works, office in New York.

Upon completion of his technical training at Clarkson College of Technology and the University of Illinois, in 1908, Mr. Brown became connected with the Crocker-Wheeler company, first as an apprentice engineer, later as district manager in San Francisco and Newark, and Eastern sales manager in New York. In addition to his company duties, Mr. Brown is serving on the Subcommittee on Government Questionnaires, WPB. He also is acting in an advisory capacity with respect to export and general Crocker-Wheeler Division sales matters.

◆

WANDEL IS NOW LOCATED AT STAUFFER MACHINE SHOPS

A new location has been announced by Kurt Wandel, consulting engineer. Formerly located at Lukenweld, Inc., Coatesville, Pennsylvania, he is now located at the Alfred Stauffer Machine Shops, Honey Brook, Pennsylvania.

Mr. Wandel will devote his entire time to consulting and the designing of special paper mill machinery under his own name, including steel Yankee dryers. The Alfred Stauffer Machine Shops will manufacture any equipment which can be released at this time.

◆

▶▶▶ Promoted overseas from the rank of lieutenant is *Captain James Winn,* of Montreal, Canada, who was formerly employed by the Anglo-Canadian Pulp and Paper Mills, Quebec. Prior to going overseas in 1940, Captain Winn was with the Royal Canadian Engineers. He is now seeing action in the Mediterranean theatre of operations.

◆

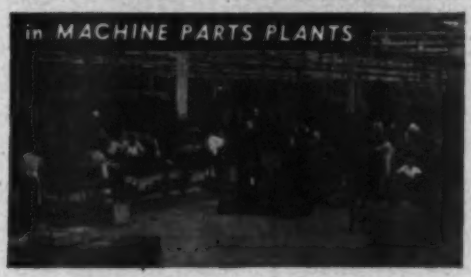
▶▶▶ The new sales manager of the Industrial Division of Detrex Corporation, Detroit, Michigan, is *W. F. Newbery,* who has been the company's south central region manager with headquarters at Dayton, Ohio.

Here Are

A Few of the Industries

in which

GATES V-BELTS *of* Synthetic Rubber



-and Many Others

Have Been Tested and *Proved*

by *YEARS* of *SERVICE*

Five years before natural rubber supplies began to be curtailed, Gates was already supplying many industries with large quantities of V-Belts made entirely of synthetic rubber.

The synthetic rubber used was a very special one and was not used as merely a substitute for rubber. It was used because, in many applications, it is greatly superior to natural rubber. For example, under severe conditions of heat and oil, the Gates special synthetic V-belt actually outwears belts of natural rubber by as much as 230%.

This is the record *not* of just a *few* belts over a *short period* of time. It is the record of *thousands* upon *thousands* of Gates special synthetic rubber V-belts that have now been tested and proved by *years* of service in Aircraft Factories, in Ordnance Plants, in Steel Mills, in Machine Parts Plants, in Lumber Dry Kilns, in Food Processing Plants—in every kind of installation where heat and oil conditions are *excessively severe*.

The time has now come when Gates long and successful experience in the fabrication of synthetic rubber V-belts is particularly to your advantage because it can *now* be put to work for you *right in your own plant*.

You have only to look in your telephone directory and call the Gates Field Engineer. He will put at your service the full benefits of Gates knowledge and experience *without the slightest obligation*.

THE GATES RUBBER COMPANY

4311

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

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NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C & S National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

CHEMICAL INDUSTRY MEDAL TO DR. GREBE OF DOW CHEMICAL CO.

At a joint meeting of the American Section of the Society of Chemical Industry, the New York Section of the American Chemical Society, and the New York Section of the American Institute of Chemical Engineers, held November 12, at Hotel Roosevelt, New York City, the Chemical Industry Medal of the Society of Chemical Industry was presented to Dr. John J. Grebe, director, Physical Research Laboratory, Dow Chemical Company, Midland, Michigan.

The medal is awarded for valuable application of chemical research to industry, and the honor was conferred upon Dr. Grebe in recognition of his contribution to the solution of some of the very difficult problems connected with the automatic control of chemical reactions, particularly with reference to the anticipatory control necessary to the reactions.

Presentation of the medal was made by Dr. Lincoln T. Work, following which Dr. Grebe gave an address on "Tools and Aims of Research."

◆

▶▶▶ Formerly general sales manager of the Jessop Steel Company, Washington, Pennsylvania, *T. W. Pennington* has been elected vice president of the company in charge of sales. He came to Jessop in 1933 from the Crucible Steel Company, and in 1935 was made manager of the Cleveland branch. Late in 1938 he was transferred to Washington, Pennsylvania, as general sales manager.

◆

▶▶▶ A recent appointment at the American Writing Paper Corporation, Holyoke, Massachusetts, is that of *Richard D. Strawbridge*, who has become assistant secretary. *Peter Freedman* is secretary of the company. Mr. Strawbridge formerly was treasurer of the Burry Biscuit Corporation, Elizabeth, New Jersey.

◆

▶▶▶ The General Printing Ink Corporation, New York, announces the appointment of *Thomas A. Lenci* to the office of treasurer. He succeeds *Perry D. Richards*, who has resigned account of ill health.

◆

▶▶▶ At a recent meeting of the board of directors of the Burrell Technical Supply Company, Pittsburgh, *C. S. Steenson* was elected secretary-treasurer of the company to succeed *W. D. Boder*. The board re-elected *G. A. Burrell* as president and *G. H. Burrell* vice president and general manager. *E. Dollhopf* was named manager of purchases and *R. M. Arnold*, manager of sales.

◆

▶▶▶ At the annual business meeting of the Direct Mail Advertising Association, held in New York October 15, *Howard Korman*, manager of merchandising and sales promotion, McCann-Erickson Advertising Agency, New York, was made president of the Association.

◆

▶▶▶ The retirement of *John A. Graves* as general counsel of Hercules Powder Company, Wilmington, Delaware, was announced on September 30. He joined the company in 1918 as assistant general counsel, and in 1939 became general counsel in charge of the chemical company's legal department. *E. Way Highsmith*, who has served as assistant general counsel since March 1, 1937, will succeed Mr. Graves.

Necrology

HOWARD L. CHURCHILL

A nationally known forester, Howard Lincoln Churchill, passed away in Glens Falls, New York, October 18 at the age of 65.

Mr. Churchill managed the Adirondack and Canadian timberlands of Finch, Pruyn and Company, Inc., Glens Falls. His methods were met with such marked success that they became an accepted model for operating similar forest tracts. Finch, Pruyn and Company was a pioneer in recognizing the need of planned timber operations and forest conservation and was soon followed in this respect by other pulp and paper companies.

Mr. Churchill was invited to tour Europe in 1928 with a study group comprising the leading foresters of the world, and some of his writings were published abroad at that time. His articles have appeared in *American Forest Magazine* and *The Journal of the Society of American Forestry*.

◆

▶▶▶ Manager of Howard Smith Paper Mills, Ltd., *Cornelius Clapp Spencer* passed away at his home in Picton, Ontario, October 12 at the age of 81.

◆

ROBERT HARDY BURSCH

The passing of Robert Hardy Bursch, prominent paper board manufacturer and sales executive, on October 24 has been announced by International Paper Company.

Mr. Bursch was 46 years of age and served in World War I. From 1922 to 1936 he was associated with Robert Gair Company, where he served in various capacities, rising to the position of vice president in charge of sales. Since 1936, he has been sales manager of the Southern Kraft Board Division of International Paper Company.

He is survived by his widow, his father, brother and sister.

◆

C. C. VAN STRY

The Cameron Machine Company, Brooklyn, New York, announces the passing of its eastern sales engineer, C. C. Van Stry, on October 14.

C. C. Van Stry

During the 15 years of his association with the company, Mr. Van Stry became widely known by paper mill officials along the Atlantic Coast south of New York which was the territory covered by him. He was frequently seen in attendance at the meetings of the American Pulp and Paper Mill Superintendents Association. Surviving are the widow and a son, John Dain, now serving with the U. S. Navy Air Force.

◆

▶▶▶ For fourteen years a sales representative for the Riverside Paper Corporation, Appleton, Wisconsin, *Jay Wallens* passed away at his home in Appleton, October 17. He was 52 years of age, and served in World War I.

◆

▶▶▶ For many years employed in various paper manufacturing positions, *Raymond B. Livermore* passed away at his home in Schuylerville, New York. He was 66 years of ago. Mr. Liver-

more had been connected with the American Wood Board Company, Clark's Mills, New York; J. J. Rogers Paper Company, Ausable Forks, New York; Bayless Paper Company, Austin, Pennsylvania; the Beaver Brook Paper Company, Danbury, Connecticut; and the Hollingsworth and Vose Co., West Groton, Massachusetts.

◆

E. LILY FABRIANI

An automobile accident caused the passing on October 12 of Miss E. Lily Fabriani, clerical assistant to R. G. Macdonald, secretary-treasurer of the Technical Association of the Pulp and Paper Industry.

Miss Fabriani was known to hundreds of those who attended the national meetings of the Technical Association and were registered by her. She had been with the Association for the past five years. She resided in the Bronx, New York, and is survived by her mother, three sisters and two brothers.

◆

▶▶▶ Following an extended illness, *Edward G. Goodell,* vice president and general manager of the Stevens Point Pulp and Paper Company, Stevens Point, Wisconsin, passed away on October 13 at Madison, Wisconsin. Mr. Goodell had been in Stevens Point for more than twenty-five years.

◆

A. C. DUNCAN

Following a brief illness, A. C. Duncan, manager of Hercules Powder Company's Paper Makers Chemical office in Portland, Oregon, passed away September 26. He was 67 years of age.

Mr. Duncan was born in Scotland and began his apprenticeship in the paper industry at the age of 12. He later came to this country and gained wide experience in his field in Canada and the United States. He joined the Paper Makers Chemical Corporation, Kalamazoo, Michigan, as salesman, and remained with it in that capacity when the company was taken over by Hercules in 1931.

◆

▶▶▶ An inventor of large paper bag manufacturing units, *Herman G. Weber,* president of H. G. Weber & Company, paper bag and paper converting machinery manufacturers of Kiel, Wisconsin, passed away at his home in Sheboygan, October 25. Mr. Weber came to Wisconsin in 1919 and was employed as superintendent of the International Paper Company, Marinette, Wisconsin, and later was chief consulting engineer at the Thilmany Pulp and Paper Company, Kaukauna, Wisconsin.

A
SIMPLE
Line of Packings

8 REASONS for the Superiority of G-T Packings

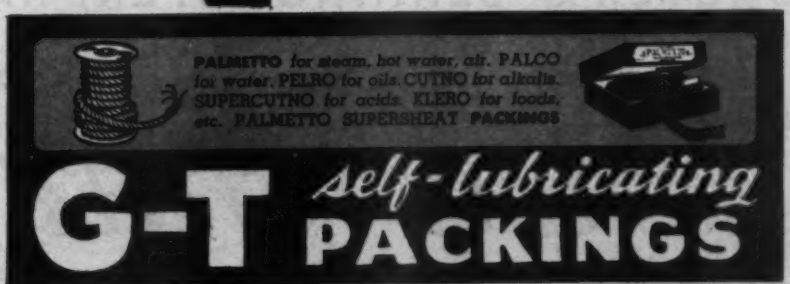
1. SIMPLE LINE . . . makes correct selection easy
2. COMPLETE LINE . . . an exactly suitable type for every service
3. SELF LUBRICATING . . . each individual strand saturated with lubricant
4. SPECIAL LUBRICANTS . . . lubricant for each service specially compounded in our own plant
5. SELECTED YARNS . . . provide tensile strength and resist high temperature
6. CONSTRUCTION . . . assures maximum endurance, longest life, lowest friction
7. EXPERIENCE . . . 80 years of manufacturing experience.
8. PERFORMANCE . . . proven in thousands of plants of every type

There is no confusing multiplicity of style numbers in the G-T line of Packings. Eighty years of manufacturing experience have taught us that a few types are sufficient to provide an efficient packing for every need.

When you standardize on G-T Packings, you gain SIMPLICITY . . . of selection . . . of purchasing . . . of warehousing . . . of application.

Simplicity is but one of the many important advantages of PALMETTO and other G-T Packings. In the panel at the left are listed features that make these packings stay soft . . . protect rods, shafts and stems . . . improve the service of packed apparatus . . . reduce annual packing costs.

GREENE, TWEED & CO.
Bronx Blvd. at 238 St., New York 66, N. Y.


PALMETTO for steam, hot water, air. PALCO for water. PELRO for oils. CUTNO for alkalis. SUPERCUTNO for acids. KLERO for foods, etc. PALMETTO SUPERSHEAT PACKINGS
G-T self-lubricating PACKINGS

AND HERE ARE *Four more Freedoms!*

We paper makers are no different from other folks in making sacrifices in the long fight for freedom from want and fear, freedom of worship and of assembly. But we don't have to fight or to wait for these other freedoms, so essential to our industry. By equipping our machines with Hamilton Felts we immediately secure freedom from picking, from slowdowns, from felt marks and from broke. Hamilton Felts are uniform. They have no "high places" to pick tiny particles from the web — no "hollows" to leave soft spots in the sheet — no irregularities to make their own watermarks on the paper. Once properly installed, Hamilton Felts permit high speed operation without excessive broke.

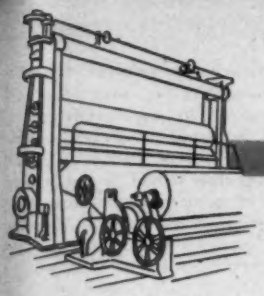
From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

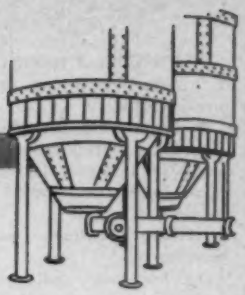
• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Maintenance Hints for Suction Extractor Rolls

1. Adjust the weights on the levers to give the maximum dryness of sheet commensurate with the quality of sheet.

2. The suction box should be set to permit a slight vacuum leak on the outgoing side of the nip. This increases the water removal and also conditions the wire face.

3. The shower should be of fresh water at a minimum of 30 lbs. at its entrance and be set at an angle against the direction of rotation.

4. See that top roll is in correct alignment with Suction-Extractor Roll. Check this at regular intervals.

5. Grind top roll as required to keep the proper crown. This is to be done at regular intervals so as to obtain the maximum life from the rubber cover.

6. The packing strips and end deckles should be withdrawn from the roll through the port holes every few weeks and the interior of the roll and suction box hosed out. The end deckles should be run in and out at every wash-up period to keep screws and ways clean and in proper mechanical operating condition.

7. The roll itself should be overhauled at least every six months, at which time all parts should be cleaned and carefully examined. The bearing seals should be checked and replaced, if necessary, the packing strips freed up and the springs cleaned and repacked with grease. A man from the manufacturer should supervise this, at least for the first overhauling.—DOWNINGTON MANUFACTURING COMPANY.

◆

Increasing Wire Life

Might it be recommended that there should be established for each machine the proper running tension for each type of paper to be made upon it, the correlating vacuum and the operating speed for a given wire of a specified mesh. This tension should be duplicated on each wire used, and the variable factors eliminated. Such control will work for more uniform wire life and greatly add to the total wire life secured over a period of time.

Suction roll slippage should be eliminated.

Table rolls, bearing and stretch rolls should be free turning.

Aprons should be properly set and maintained.

Suction box covers should be properly shaped and maintained.

Dandy rolls should be supported in relation to suction boxes.

Liberal water sprays should keep wires clean of grit and filler.

Oscillating boxes should replace stationary boxes and they should be of the correct type.

Souring and cleaning of wires should be controlled.

Breast and driven rolls should be of sufficient diameter and free turning.

Top couches should be eliminated, if possible, or very carefully maintained in relation to supporting rolls and with suitable firm coverings.

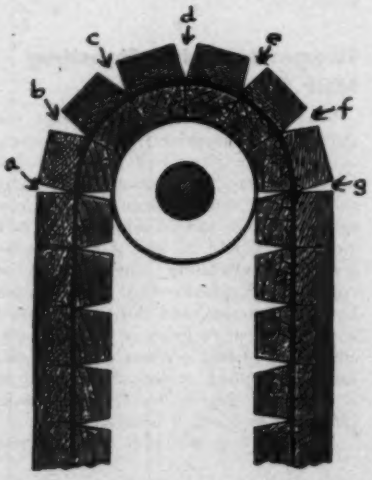
Stretch rolls should be equalized in adjustment of wire.

Deckle straps and wire guides should be carefully checked and maintained.—HARRY G. SPECHT, *The Paper Industry.*

◆

Calculating Pulley and Belt Speeds

Reproduced from Cooper's *Use of Belting,* published about 50 years ago, the accompanying illustration cleverly shows the action of a thick belt on a small pulley. The change in length taking place in a belt passing around the pulley is indicated by the inelastic blocks. Spaces (a, b, c, d, e, f, and g) indicate the stretch on the outside of the belt surface; while the closing up of the blocks on the inner surface indicates compression. The neutral axis, indicated by the heavy black line through the center of the belt, is the only portion of the belt that does not change in length.



The illustration makes it plain why belt thickness should always be considered when computing pulley and belt speeds. The old rule—belt speed is directly proportional to pulley diameter—is not correct. For exact computations, the following formula should be used:

$$n = N\frac{D+t}{d+t}$$

where

n = rpm of driven pulley
N = rpm of driving pulley
D = diameter of driving pulley in inches
d = diameter of driven pulley in inches
t = thickness of belt in inches

Putting the formula in the form of a rule, it becomes: Add the thickness of the belt to the diameter of the driving pulley (both in inches); multiply by the rpm of the driving pulley; then divide by the sum of the belt thickness and diameter of driven pulley (both in inches). The result will be the rpm of the driven pulley. —W. F. SCHAPHORST, M. E.

◆

Motor Inspection Schedule

Frequency of inspection and degree of thoroughness vary and will have to be determined by the maintenance engineer. They will be governed by (1) the importance of the motors in the production scheme, (2) percentage of time the motor operates, (3) nature of service, and (4) environment.

An inspection schedule must be elastic and adapted to the needs of each plant. The following schedule, covering both a-c. and d-c. motors, is based on average conditions so far as duty and dirt are concerned.

Every Week

1. Examine commutator and brushes
2. Check oil level in bearings
3. See that oil rings turn with shaft
4. See that shaft is free of oil and grease from bearings
5. Examine starter, switch, fuses, and other controls
6. Start motor and see that it comes up to speed in normal time

Every Six Months

1. Clean motor thoroughly, blowing out dirt from windings, and wipe commutator
2. Inspect commutator clamping ring and brushes
3. Check brushes and renew any that are more than half worn
4. Examine brush holders and clean them if dirty. Make sure that brushes ride free in the holders
5. Check brush pressure

6. Check brush position
7. Drain, wash out, and renew oil in sleeve bearings
8. Check grease in ball or roller bearings
9. Check operating speed or speeds
10. See that end play of shaft is normal
11. Inspect and tighten connections on motor and control
12. Check current input and compare with normal
13. Run motor and examine drive critically for smooth running; absence of vibration; worn gears, chains, or belts.
14. Check motor foot bolts, end-shield bolts, pulley, coupling, gear and journal setscrews, and keys
15. See that all motor covers, belt and gear guards are in good order, in place, and securely fastened

Once a Year

1. Clean out and renew grease in ball or roller bearing housings
2. Test insulation by megger
3. Check air gap
4. Clean out magnetic dirt that may be on poles
5. Check clearance between shaft and journal boxes of sleeve-bearing motors, to prevent operation with worn bearings
6. Clean out undercut slots in commutators
7. Examine connections of commutator and armature coils
8. Inspect armature bands

Records

There should be a record card for each motor in the plant. All repair work, with its cost, and every inspection can be entered on the record. In this way, excessive amounts of attention or expense will show up and the causes can be determined and corrected.

Inspection records will help to tell when motors should be replaced because of the high cost to keep them in operating condition. Misapplications and the like will also be disclosed.—General Electric Company.

◆

Soldering Lugs on Ends of Wire Rope

The practice of casting a lug of solder onto the ends of wire rope eliminates a source of injury and infection to all wire rope handlers. The lug also serves as a means for readily attaching hoist ropes to drums of overhead traveling cranes. Likewise, where ropes are fastened by clips, the lug provides an additional safety feature—in case of slippage of the rope, the last clip will catch the lug and hold the rope.

A steel mold, designed to accommodate three sizes of wire rope, is illustrated by the accompanying sketch. The two parts of the mold are held together by two lag bolts. Rope sizes for which the mold is to be used are stamped on both halves of the mold.

To prepare the end of a rope for casting a lug, the strands are unlayed for about an inch and the hemp center is cut back the same distance. The unlayed strands are then cleaned of lubricant and grime by dipping them into a half-and-half solution of commercial muriatic acid and water. The rope should not be inserted so deep that the acid will get on the hemp center. The strands are then tinned by dipping them into molten solder. It may be necessary to dip in acid and solder several times before a good tinning job is obtained. By bunching the strands together they are passed through the bottom of the mold, and then are spread apart, after which hard solder is poured into the mold. After the solder cools, the screws holding the mold together are removed, allowing the two mold sections to be separated so the rope with the attached lug of solder can be removed.

To eliminate sharp edges, which might cause scratches or cuts to the hands of those handling the rope, the edges of the lug are filed slightly round.

Where solder lugs are to be applied to ordinary, or non-preformed rope, it is necessary to apply a seizing of soft wire to the rope at a point just below the bottom of the mold, to prevent the strands from raveling. The seizing must be applied before the strands are opened up, and it should be followed by another seizing an inch or so below the first. After the lug is cast, the seizings may be removed.—C. R. Hochmuth.

◆

Suggestions for Painting Mill Equipment

Before painting, machinery (except wet ends of paper machines), motors, pumps, etc., should be cleaned of grease, oil and foreign matter by thoroughly scrubbing and washing with a suitable solvent; rust spots should be sanded down to the bare metal and should be dry. Then a quick-drying, rust-inhibiting primer should be applied to all places where the old finish has been removed, and this coat followed with one or more finishing coats immediately upon drying. When the final coat has been applied, it should withstand to a maximum degree the severe exposure conditions to which it is subjected.

Paper machine wet ends should receive the same care in the preparation of surface as has been outlined, but, since these surfaces are subject to considerable water, they should be wiped as dry as possible and should be free of foreign material. All bare spots then should be touched up with a coat of primer, and finishing coats capable of withstanding constant exposure to moisture applied.—R. C. Sheeler, The Paper Industry and Paper World

◆

Cutting Packing Rings

It is common practice when cutting packing rings, to fit each one over the shaft or mandrel, individually. Much time can be saved if the packing can be tightly spiralled in a very close spiral directly on the shaft or mandrel, then laying a straight edge across the packing parallel to the axis of the shaft and carefully marking or scribing and packing. The packing may then be removed from the shaft or mandrel and cut on a flat surface at the places marked. Perfect fitting rigs will then be obtained and it is much easier to cut the rings with any type of joint that the operator may consider satisfactory.—Johns-Manville.

◆

Supporting Lead Pipe

Lead pipes in the horizontal position are usually supported by placing them in steel or wooden troughs. Vertical pipe lines may be held in position with steel clamps, spaced 18 inches or so apart and securely bolted to a rigid supporting structure. Another method of supporting lead pipe, either vertically or horizontally, is by inserting and expanding it in standard steel pipe. Users of this procedure report that it is not only more satisfactory but cheaper than angle iron or wooden supports.—*Dutch Boy Quarterly.*

◆

Keep Inward Flow Screens Clean

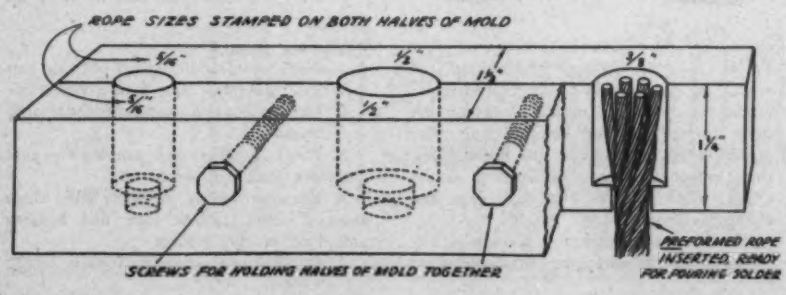
Cleanliness, *inside and out,* is the first rule of good screen maintenance. This means thorough wash-ups at the usual week-end shut-down periods and complete internal scouring out at the time of the general machine clean up.

Keep all painted surfaces completely covered with paint.

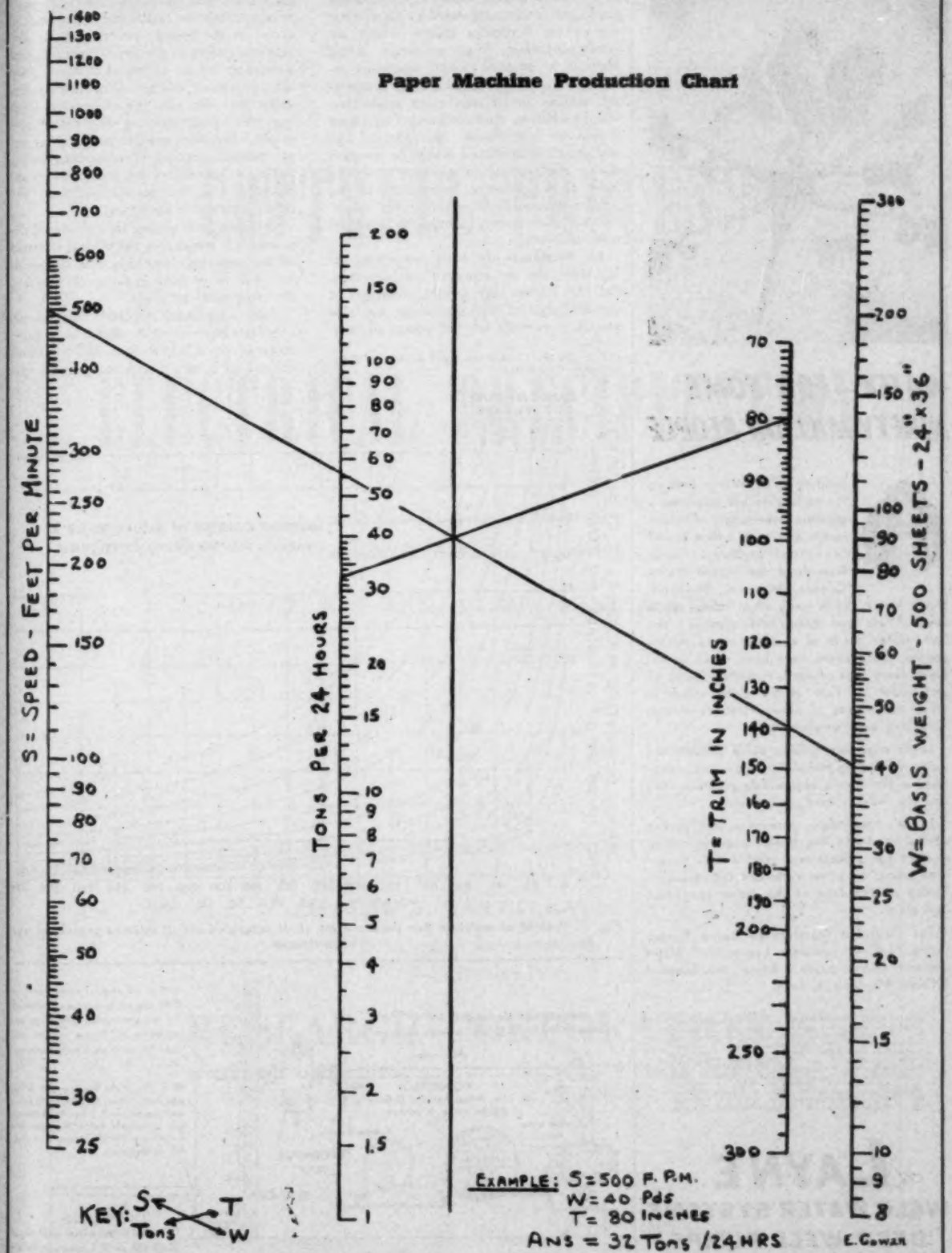
Before the screen is shut down for any length of time pass water through it for a few minutes with the shower pipe operating to prevent stock from drying and hardening on the screen plates or other parts.

Remove and clean the deckle straps or packing bands at the open end of the screen cylinder once a week.

Keep the compartment outside the deckle straps filled with fresh water, letting a constant stream of water overflow at the top of the compartment to provide a continuous washing of all surfaces in contact with the deckle bands. Drain and scour this compartment at each weekly cleaning period.—Bird Machine Company.



Paper Machine Production Chart



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Importance of Air Compressor Auxiliaries*

▶▶▶ WHILE THE COMPRESSOR is the prime unit in any compressed air plant, there are certain auxiliaries thereto which are vitally important, if not necessary, if the plant is to produce overall maximum results. As a rule, practically every compressor requires an air receiver of ample size, and, in addition, most compressed air plants should use aftercoolers. An approved and efficient air filter should always be installed in the suction, and in addition to this, a great many protective instruments in the way of gauges, thermometers, relief valves, suitable drains, etc., should be installed when necessary.

Air Receivers:—In every compressor installation, the air receiver forms an essential part. It not only absorbs pulsations in the discharge of the compressor, but also acts as a reservoir for the storage of compressed air, furnishing some reserve capacity to compensate for instantaneous demands in excess of the compressor capacity. It also acts as a condenser for some of the moisture present in the air or gas as it comes from the compressor, and to collect such condensation that may pass the aftercooler, keeping same from entering the distribution system. Receivers are also necessary to supply uniform pressure for governing instruments. If governors are connected to the discharge line, the pulsations therein will result in unstable operation.

Obviously, the proper functioning of this accessory is essential to the overall efficiency of the compressor assembly, and any weakness will be revealed in faulty operation of the compressed air plant.

The Compressed Air Institute endorses only air receivers that meet the requirements of the A.S.M.E. code, and has standardized on a line of such receivers, in sizes

(*) From the Compressed Air Institute, Educational Committee.

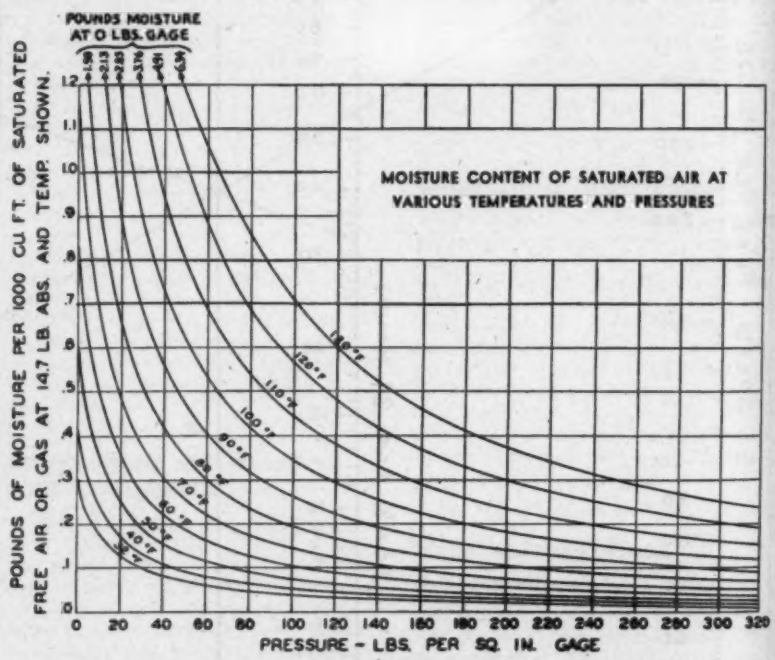
POUNDS MOISTURE AT 0 LBS. GAGE
POUNDS OF MOISTURE PER 1000 CU. FT. OF SATURATED FREE AIR OR GAS AT 14.7 LB. ABS. AND TEMP. SHOWN.
MOISTURE CONTENT OF SATURATED AIR AT VARIOUS TEMPERATURES AND PRESSURES
PRESSURE - LBS. PER SQ. IN. GAGE

Fig. 1—Weight of moisture per thousand cu. ft. of saturated air at various pressures and temperatures.

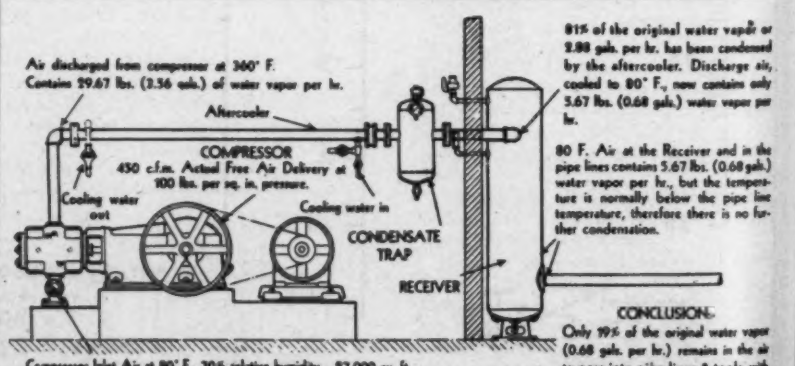
Air discharged from compressor at 360° F.
Contains 29.67 lbs. (3.56 gals.) of water vapor per hr.
Aftercooler
COMPRESSOR
450 c.f.m. Actual Free Air Delivery at 100 lbs. per sq. in. pressure.
Cooling water out
Cooling water in
CONDENSATE TRAP
RECEIVER
Compressor Inlet Air at 80° F., 70% relative humidity. 27,000 cu. ft. per hr. carries 29.67 lbs. (3.56 gals.) of water vapor per hr.
81% of the original water vapor or 2.88 gals. per hr. has been condensed by the aftercooler. Discharge air, cooled to 80° F., now contains only 5.67 lbs. (0.68 gals.) water vapor per hr.
80 F. Air at the Receiver and in the pipe lines contains 5.67 lbs. (0.68 gals.) water vapor per hr., but the temperature is normally below the pipe line temperature, therefore there is no further condensation.
CONCLUSION
Only 19% of the original water vapor (0.68 gals. per hr.) remains in the air to pass into pipe lines & tools, with practically no further condensation.

Fig. 2—Compressor installation complete with aftercooler.

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and capacities shown in the table below for discharge pressure up to 125 pounds per square inch. Relief valves must not be set higher than the pressure stamped on the tank.

Aftercoolers—Aftercoolers are advisable, if not absolutely necessary, in nearly every air compressor installation as a means of removing water and oil vapors by means of condensation. Compressed air or gas contains moisture in some degree, dependent upon the condition of the air taken into the compressor. As the air is compressed, it does not condense its moisture because of the rise in temperature that accompanies compression, and thus it is carried along as a vapor through the receiver and into the pipeline. The temperature of the compressed air falls rapidly in the discharge line due to radiation, resulting in much water being condensed in the line, which, aside from being objectionable in the line for many reasons, is very destructive to pneumatic tools or other mechanical equipment in which the air is used.

It is to force this precipitation by lowering the temperature of the air before it enters the discharge line that after-coolers are employed. They are installed near the compressor to condense the moisture before it has a chance to enter the line, and should be installed with an automatic trap to dispose of the condensation as it occurs.

Aftercoolers are of the shell and tube type and of course depend for satisfactory performance upon the use of the coldest water available. Obviously, unless the aftercooler is of liberal size, cooling will be incomplete, which means that the maximum amount of water will not be removed from the air. The importance of installing aftercoolers of proper design and capacity is indicated by the accompanying air-reaction chart (see Figure 1).

It will be noted that if 1,000 cubic feet of saturated air is drawn into a compressor at atmospheric pressure and at a temperature of 70 Fahr., it will contain 1.12 pounds of moisture. This moisture will, somewhere along the line, condense, and the water pass into any mechanical equipment for which the air is used, causing very rapid wear of these parts. Much loss of time and loss of compressed air is also caused by the necessity for the operator blowing out the air lines each time he uses compressed air for blowing away chips and for similar purposes because of the water present in the line.

Aftercoolers also present an element of safety in every compressor plant. In case any carbon accumulating on the walls of the discharge pipe should become incandescent and starts to burn (which condition

A.S.M.E. Standard Air Receivers

Diameter (Inches)	Length (feet)	*Actual compressor cap. for which receiver is suited. (cu. ft. free air per min.)	Volume for (cu. ft.)	Types of opening for cleaning
14	4	60	4½	Openings for
18	6	95	11	inspection and
24	6	185	19	cleaning are
30	7	305	34	required and
36	8	450	57	must meet specifi-
42	10	640	96	cations of
48	12	1,275	151	A.S.M.E. Code
54	14	1,900	223	for Unfired
60	14	3,000	275	Pressure
66	18	4,500	428	Vessels.

(*) For automatic start-and-stop service, extra large receivers are recommended to avoid starting too frequently.

All receivers up to 42 inches x 10 feet inclusive have screw openings—48 inches x 72 feet and larger have flanged inlet and discharge openings. Vertical receivers must have base to raise them 6 inches above floor to permit hammer test by inspector.
Receivers are furnished complete with safety valves, pressure guage, hand holes or manhole as required by Code, drain valve and nipple, and base for vertical receivers.

might occur with careless operation such as using too much oil of inferior quality and, if in addition, valve and piston leakage exists) the fire is promptly quenched as soon as it enters the aftercooler and no harm occurs.

Air Filters and Silencers—It is usual practice to run the intake pipe to the outside of the building in order to obtain as cool air as possible. Atmospheric conditions vary, with winds carrying much dust and grit. As a result, the air compressor inlet must be provided with air filters to prevent this dust and grit from passing into the compressor, where it causes rapid wear of the working parts, as well as combining with the lubricating oil as a binder and forming obstructive and abrasive coating on cylinder, valves, etc. The carbon sometimes found on valves, discharge pipe, etc. will be found upon analysis to be mostly dirt with some oil, which can cause leakage by getting under the compressor valves. Such gritty deposit will also add to the rapid wear of moving parts.

The use of filters on the intake can also be classed as an element of safety in operation, since the elimination of sand will remove one hazard that might produce a spark where operation is sufficiently faulty to cause a combustible mixture to form in the discharge line.

Efficient commercial intake filters have become so standardized and relatively cheap that the earlier method if installing a homemade filter of questionable efficiency is no longer justifiable. The compressor manufacturer best knows what size and type of filter will give best service with his compressor, with the least pressure drop in the lines. If possible, a suction filter should not cause a pressure drop in the suction line of more than roughly 2 inches of water.

When the noise of the suction is objectionable due to the location of the compressor, an air silencer should be used. Several makes of satisfactory silencers are now readily available and recommendations can be obtained from the compressor manufacturer. Obviously, the silencer also should not offer excessive resistance to the flow or air.

Discharge silencers are also available when excessive noise is experienced on the discharge, frequently called "tank ring," resulting from discharge pulsations impinging against the air receiver.

Protective Devices—Many protective devices should be installed in every compressed air system. If a shut-off valve is installed in the discharge line, a relief valve must be placed on the compressor side of the valve to protect the machine in case the operator starts the unit before opening the valve. Part of the standard equipment of air receivers is a relief valve, but that will not protect the compressor if a shut-off valve is located between the receiver and compressor.

Drains of ample size should be installed, wherever needed. Intercoolers and aftercoolers condense considerable moisture that is carried in the air. This condensate must be carried away and not allowed to pass through the next compressor cylinder. It is good practice to make these drains automatic so that their satisfactory functioning

Engraving was among the early arts of New England. The first printing shop of North America was set up by Matthew Daye in Cambridge in 1638 and Boston soon became the center of the graphic arts.

This stimulated the demand for wood cuts, and later on, after printing from plane surfaces was introduced in 1796, a market was already prepared for intaglio engravings. Paul Revere, Peter Pelham and John Singleton Copley, the celebrated portrait painter, were among the best of early American Engravers. They were both artists and craftsmen, in an art affiliated with paper-making.

Among other allied arts the weaving of papermakers' felts was slower to get a foothold in America. Not until after the war between the States were domestic felts available. Now the product of American looms is universally used in the paper mills of the United States. The experience of three generations of the same family is reflected in the reliable character of **DRAPER FELTS.**

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is not dependent upon attention by the operator, but care must be exercised to insure that the automatic trap works, which is not always the case.

In many cases, especially on the larger steam and gas engine driven compressor, an overspeed shutdown is desirable; such machines usually have limiting speed governors as standard equipment, whose purpose is to limit the maximum speed of the machines. However, in case these governors should stick for any reason when the machine tries to overspeed, a device can be installed that will function to shut down the compressor. This device, if not standard equipment on the machine, can be obtained at a small extra cost.

For larger equipment, a lube oil failure shut-down is also desirable, since on the larger machines oil failure would result in a considerable repair charge. In case of oil failure, the unit is usually shut down automatically, although in certain installations, such as process work, shut down of the equipment may be very undesirable, and in such cases the device could sound an alarm to give the operator warning that there is something wrong with the oiling system.

Jacket water failure shutdown is a protection for the machine in case the operator fails to turn on the cooling water or in case the cooling water supply should fail for any reason. This device, while not regularly supplied with compressor equipment, may be had at a small additional cost.

Where the compressor is installed in an inaccessible location or where the operator can make only daily trips to inspect the machine, it is frequently desirable to add additional protective devices; such as a shutdown from excess pressure in the discharge lines; a shutdown due to excess temperature on the discharge for any reason whatsoever; in the case of special operations, it is sometimes thought advisable to install a recording discharge gauge or a recording thermometer to record these operating conditions. The compressor manufacturer will be glad to make recommendations for any special features.

Discharging Management's Responsibility for Safety in an Industrial Plant*

GEORGE J. PECARO, Plant Manager
The Flintkote Co. (Meridian, Miss.)

▶▶▶ Because my subject deals with Management and the discharge of one of its important responsibilities, I want to discuss briefly the scope of Management and some of Management's functions. Management is best described as a directive force for coordinating the efforts of men and machines in the use of materials, towards the production of goods and services. The men comprising this directive force represents Management, and the application of this directive force represents the function of Management.

Management is made up of a number of individuals whose duties and responsibilities are varied, but generally Management can be divided into two distinct classes; namely, top Management and direct Management. By top Management, I refer to those individuals who formulate and direct the policies of a company. By direct Management, I refer to those individuals who interpret and direct the execution of those policies.

The successful utilization by Management of men and machines is measured in terms of a consistent and continuous return of profit for the stockholder's invested dollars. The degree of Management's success is measured by the proportion of dollars earned to dollars invested. You will note that in my definition of Management that I have made no reference to safety or to any other of the specific responsibilities or functions of Management. It is assumed that if Management is to be successful and is to earn a maximum number of dollars for dollars invested, it must successfully discharge all of its responsibilities.

The specific responsibilities of Management are safety, housekeeping, quality, production and cost, all of which must be continuously discharged all of the time. The order in which I have listed these responsibilities is debatable as to the order of their importance, but the order of importance is a matter of opinion. The essential and important fact is that these responsibilities of Management constitute the chain between investment and profit, which, if shortened by any one of the component links makes impossible the attainment of the maximum profit objective of Management.

For Management to discharge its responsibilities, it must recognize and be fully cognizant of all phases of its responsibilities. While safety has been included as one of the activities of Management, it has not always been recognized as one of the necessary links in the chain of Management's profit objective and has not been maintained on the same plane of recognition with production. This thinking has resulted from the fact that safety is an intangible phase of Management's profit objective which could not be accurately measured in dollars and cents, and for that reason has been relegated to a position of relative unimportance to the attainment of the profit objective. I do not mean by this that Management does not endorse accident prevention and the safety program. On the contrary, there is probably no phase of Management's activities which is more highly endorsed to the employees of a company than the safety program. Unfortunately, this endorsement by Management of the safety program has not necessarily constituted a preface to an

(*) Address given before the Paper and Pulp Section of the National Safety Council at the 32nd Annual Safety Congress held in Chicago, October 5-7, 1943.

aggressive fulfillment of the program, because Management has not made safety a production function.

You may object to my several references to profit and the profit objective as it relates to Management's attitude towards the safety program. It would be utopian to say that industry's safety program has developed because of industry's concern for the well being of the individual employees. It would be nearer the truth to say that industry, for a long time, was reluctant to spend money to protect its employees until it was shown that the cost would return a profit. Plants are built and money is invested for the production of goods and services with the objective being profit. Safety, therefore, must be a means for accomplishing this objective if it is to receive proper recognition by Management.

The top Management of The Flintkote Company believes that the occurrence of accidents is an indication of careless Management practices, resulting in the waste of materials, waste of machinery, inefficiency and delayed production. The top Management of my company have shown by their attitude that they are convinced of the real value of an organized safety program in the profit objective and have placed upon the shoulders of direct Management the responsibility for the execution of an efficient safety program.

The confirmation of the top Management's endorsement of accident prevention in our company has come in the form of tangible dollar appropriations to cover expenditures for a safety organization, the purchase of safe operating equipment, the construction of buildings designed for safe operations, the guarding of equipment, the purchase of educational literature and posters and other paraphernalia necessary for the proper execution of a safety program. While there have been instances where appropriations have been questioned for the purchase of equipment for new developments, there has never been any question on an appropriation submitted to improve the safe working conditions in my plant. These actions on the part of the top Management of my company have demonstrated in a concrete way to me and to my operating organization that the top Management not only approves of the safety program but is willing to pay for such a program and, therefore, expects a return for its money by the efficient execution of the program. The approach to safety, therefore, has been to make it a production activity to be executed by the direct Management as a production function. A production function constituting a job to be analyzed, organized, deputized and supervised.

There is no engineer or technician who can anticipate all of the hazards of machinery. Experience and the operation of equipment revealed in our plant hazards which were unforeseen on the drawing board and which were corrected immediately that they become evident. Safeguards must not be static, they must be changed and improved as usage and experience indicates defects. In our plant this meant that safeguards were inspected and maintained exactly as production equipment was inspected and maintained. The main-

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tenance of the buildings and working areas necessitated clean floors, uncluttered working areas and neat storage spaces.

Because of the close relationship of housekeeping to safety, housekeeping has been used in my plant as an index of the thoroughness with which Management is protecting the company's investment for buildings and equipment. It is an index of Management's efforts to produce a quality product. A neat, orderly plant stimulates carefulness on the part of employees and enables the operations to be carried on more efficiently. Since the safety program is largely one of education and the development of continued interest among employees, a neat and orderly plant is the best advertisement of the company's attitude towards safety.

I have already stated that production involves the utilization of men and machinery. It is a comparatively simple problem for Management, in any kind of operation, to design and protect machine tools. **Machines are inanimate objects** which can be redesigned to suit the peculiar conditions of operation. **The man tool, however, is a tool which cannot be redesigned physically.** Men are like the designs in snowflakes, no two are alike and, therefore, must be carefully selected and trained. Approximately 85 per cent of the accidents in industry are accidents resulting from the fault of the man rather than the machine. Like machinery, therefore, men must be selected, checked and maintained if best results are to be secured.

Give the workers half the care and study given the machinery in an operating plant and Management will reduce not only accidents, but also operating costs. A careful study of the men who make up the employees in the plant is extremely important to the success of any safety program and, for that matter, any production program.

The area in which the industry is located affects the success of a safety program. An area predominantly industrial contains workers who are familiar with machinery and who, therefore, should be more familiar with the hazards of machinery. The laws in the state in which the industry is located affects the safety program. The state which has stringent industrial safety standards contains employees who are familiar with and expect supervision.

The proper selection of employees cannot be too carefully stressed. The method of selection will differ and must be worked out, as I have already stated, according to the conditions existing in the area in which the plant is located. It is said that the Army assigned a group of eminent psychiatrists to determine the best way to select soldiers for duties on the various fighting fronts. After many tests the learned professors made this report: "The best way to find out whether a soldier would be more effective in the desert or in the North is to ask him the question, 'What kind of weather do you like, hot or cold?'" Unfortunately, the problem of man selection in industry is not as simple as that. But simple or complex, the proper selection of employees is as important as the selection of machinery and deserves as much consideration.

When new machinery is installed and put into operation, a careful check is made of its alignment, its bearings and all other mechanical devices. Care is taken to apply loads to the new machinery gradually until it is well broken in. New men deserve the same consideration. There will never be a time when the worker is more receptive to constructive ideas and is more willing to take direct guidance from his supervisor than when he first comes to work. The first opportunity to sell the company's safety program and the plant's objectives occurs during the first few days on the job. In our plant the personnel supervisor takes each new employee on a tour through the department in which he is to work. During this tour, the location of the first-aid room, toilets and locker rooms are shown to the new employee. Upon completion of the tour of the department the new employee is introduced to his foreman and the foreman carries on with the program of making the new employee feel that he is accepted as a part of the organization. The responsibility for the proper instruction of the man in the right way and the safe way to do his job is on the shoulders of the foremen for whom he will work. The attitude the foreman displays with the new man is the attitude the new man will have towards the company. If the foreman is disinterested and abrupt in the handling of the new man, you can expect just such an

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attitude from the new man towards the company. If the foreman's attitude is wholehearted, interested and helpful, the new employee will in most instances be a loyal employee interested in the welfare of the company.

I have tried in my plant to create, as soon as possible, a friendly attitude in each new employee. After a new employee is working and his name is placed on the payroll, I receive a notice from the personnel department with the new employee's home address. I write a letter to each new employee, addressed to his home, and in this letter I attempt in plain language to convey the company's attitude towards safety and to impress upon him his own responsibility to the company to work safely.

All of these steps in the selection and placement of a new employee are nothing more than a build-up for creating safety consciousness in the man. It does not necessarily follow that safety consciousness is always created. Actually, it is the exceptional employee who responds exactly as desired. However, here again the man tool must be compared to the machine tool. Production machines are carefully checked for their efficiency and production and it follows, naturally, that man must be just as carefully checked as to his production and safety efficiency after he has worked a short time, and he should be checked periodically thereafter.

To conduct an effective safety program in an industrial plant requires continuous and organized efforts. The top Management of my company has delegated the responsibility for the preparation of the safety program and for keeping them informed of the results being obtained in the execution of it, to individuals who are experts in personnel, insurance and safety. The direction of the safety program is the responsibility of an insurance and safety director and a personnel director. These directors plan and co-ordinate the safety program in line with the company's policy for safety and advise the top Management of the results secured.

Essentially, a similar safety organization is set up in my plant. The plant supervisory organization includes a safety and personnel supervisor who directs the accident prevention program. This man is an organizer who adapts the company's safety program and modifies it to suit the conditions existing at the plant. It is his responsibility to study and check the safety program in operation and to maintain it at its highest efficiency for securing the necessary information to measure its efficiency. The safety organization includes the necessary clerks for maintaining accurate personnel and safety records, a nurse to handle first-aid treatment and first-aid education, and a safety and personnel director. The safety supervisor is recognized as a member of the production organization and is included in all production meetings so that he may be familiar with the production problems, and where necessary, relate those problems to his activities. It is obvious that the selection of the safety supervisor must be made as carefully as the selection of any production supervisor. His job is a function of production. It must be pointed out here that while the operating manager can delegate the work of directing the safety program to the plant safety and personnel supervisor, he cannot delegate the responsibility for the results secured.

The direct safety organization which I have outlined is supplemented, in my plant, by the indirect safety organization, comprising a safety committee consisting of employee representatives from the various departments. This safety committee meets regularly with the personnel supervisor to review plant conditions and to make recommendations for improvements within the plant and to review all lost-time and medical-aid accidents, and make disciplinary and corrective recommendations. We have found that disciplinary action recommended by the safety committee following a lost-time or medical-aid accident is usually basically sound and if followed is received with less resentment than when the disciplinary action originates from supervision.

In addition to the employees' safety committee, we have a supervisors' safety committee comprising department heads and foremen which meets weekly to review all first-aid accidents which occurred during the previous week and to discuss reports from the employees' safety committee. During stated intervals, the employees' committee meets with the supervisors' committee, together with as many other employees who can attend the meet-

ing. At the combined meetings, questions of general interest on safety are discussed and policies decided.

The principal item of discussion in the supervisors' safety meetings is the review of first-aid accidents reported during the previous week. I have found these reviews and studies of first-aid cases to be the most important source of accident prevention information from the plant. Most of the corrective measures that have been made in our plant have resulted from conclusions drawn from the type and trend of reported first-aid cases. Because of the importance that we have placed on the reported first-aid cases at our plant, we have developed a complete form for entering the data concerning the causes of the accident. This form is filled in immediately after the first-aid accident is treated and, because of the thoroughness with which these cases are discussed, we have insisted that the reports be accurately and fully filled out and checked by the foremen.

We are at the present time preparing an accident proneness index for each employee which is based on the number of first-aid cases reported for each employee during the time that he has been employed. This report is called the Employee's Personal Hazard Index, and while we do not yet have sufficient data with which to fully utilize this index, indications are that it will prove the most valuable control of accident prevention at the plant. It is our plan to report each month to the foremen the hazard index for each employee working for him. We propose to establish an index figure which, when established by any employee, will require the foreman to talk to the employee regarding his safety record. A second index figure will require the foreman to either transfer the employee to some other work or let him go. We have encouraged the reporting of first-aid accidents and have insisted that they be reported. The first-aid reports are the best barometer of plant safety, and if properly read and closely watched by those who are responsible for the execution of the safety program much of the uncertainty of safety control can be eliminated.

For any planned program to succeed, it is necessary that the operating manager delegate the execution of it. It is this step in the safety program that necessitates deputizing certain individuals to discharge the responsibilities of safety satisfactorily, thoroughly and consistently. Although the chief deputy in a safety program is the safety supervisor, the responsibility for the success or failure of the program is in the hands of the supervisors who direct the men and machines. It is the duty of the personnel department to supply men who will work safely. It is the duty of the safety supervisor to formulate the plans for safe working. It is the obligation of the company to supply the machinery and the working space for safe operations. It is the responsibility of the supervisors to utilize the men, the machinery and the plan to accomplish the purpose of the safety program. The success or failure of any manufacturing operation depends upon the ability and attitude of the department heads and the foremen, assuming that the operat-

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ing manager is himself sold on the program. Unless the plant operating organization is convinced of the real value of the safety program as a production function and takes the leadership in it, effective results will not be secured.

The final step in the successful execution of a safety program is that of supervision by the operating manager. The execution of the safety program is vested in the foremen and department heads just as the execution of the production program is vested in these men. However, production results would be haphazard if they were not supervised by the operating manager. Safety results, likewise, will be haphazard if the operating manager does not follow the program closely. The operating manager should know the accident experience of the individual departments and should discuss safety in general with the supervisors during his plant trips. He should be present at all safety meetings and, where necessary, preside at these meetings. The prevention of accidents requires, above all, leadership from the chief plant operating official.

It is my firm conviction that the operating manager who has a hit and miss attitude towards safety will have the same attitude towards production, quality and costs. The underlying cause of accidents, poor supervision, is likewise the underlying cause for poor production records. If employees are not properly supervised for safety it is reasonable to expect that there may be a similar lack of supervision in their production work. The supervising of accident control demands the same consistent check upon operating methods and conditions that production control requires. If safety supervision is lax or ineffective, it is well to look into the production supervision, it also may be lax.

The success of the safety program, therefore, is a matter of the extent to which direct Management will go to analyze the problem of safety; the extent to which Management will organize to carry out an efficient program of safety and deputize authority to execute the program; and finally the extent to which it will supervise the program of safety as a function of production Management.

I have not come here today to speak as an authority and an expert on the control and prevention of accidents. I have no short-cut to offer towards accomplishing any reduction in accidents or in discharging Management's responsibility for safety. There is nothing particularly new or novel in what I've said today because as I see it Management has proved its ability to discharge its responsibilities for production and, therefore, Management already has the knowledge of what must be done to discharge its responsibility for safety. The important thing is that Management recognize the fact that safety is a production function which must be approached with the same attitude and organization with which production problems are solved. Select, check and care for your men and machines for safety as for production and results will be forthcoming.

I have reiterated in this talk Management's profit objective and its obligation to its stockholders. If I have not stressed Management's obligation to its employees it is not because I minimize its importance. The obligation of Management to its employees is an obligation which brooks no mistakes. Accidents are the mistakes of Management. The mistakes of Management which result in loss of financial gain to a company can be compensated for by subsequent corrective measures. The mistakes of Management which make human cripples can never be compensated for. In closing therefore, I want to say that **safety is not an argument nor a theory; it is a responsibility which is never fully discharged. It is a function of Management which requires technical application and human understanding.**

Convention Papers . . . Abridged

Acclimatization of Bacteria to Disinfectants Used in the Paper and Board Industry

JOHN W. APPLING[1] and B. F. SHEMA[2]

Bacteriological control in paper and board mills can usually be accomplished by the application of good housekeeping methods and/or by the judicious use of chemical disinfectants. In the paper and board industry, the mills which make milk container stock have pioneered in the field of bacteriological control. As a result, these mills have no slime problem and they probably have no bacterial degradation of woolen felts; however, some of them have occasionally experienced unsatisfactory bacteriological control. It has been suggested that the reason for this might be found in the acclimatization of bacteria to the disinfectant being used.

At least three types of chemical acclimatization are recognized by Heilbrunn: (*An Outline of General Physiology*, Philadelphia, Saunders, 1937. Chapter XXXIV.)

(*a*) Acclimatization of aerobic organisms to low oxygen concentrations,

(*b*) Osmotic pressure acclimatization (which may also be regarded as physical acclimatization),

(*c*) Acclimatization to injurious sub-

(1) Research Associate; (2) Technical Assistant, The Institute of Paper Chemistry.

This section includes abridgments of some of the papers read at the **Army and Navy Conference,** sponsored by **TAPPI,** in Chicago, September 21-24. The first installment of these abridgments was published last month.

Million dollar coal preparation plant at the Victory Mine, Pyramid Coal Corporation near Terre Haute, Indiana, where Indiana No. 3 seam coal is mined. The conveyor from the mine slopes 18° above ground and 16° underground. The conveyor is approximately 700 ft. long of which about 500 ft. is underground. Capacity 600 tons per hour at 375 ft. per min.

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The illustration above shows the crew repairing a portion of the belt where the upper plies ripped and then the tear offset a few inches and the lower plies were ripped. Two rows of fasteners and rip plates were required for repairing this section of the belt. The rip was first "tacked" together every few feet with a rip plate.

The above illustration shows the fasteners and rip plates applied to a portion of the belt where the rip was clean and straight.

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stances or poisons. According to Heilbrunn, "One of the most striking and, from the standpoint of continuance of life on this planet, one of the most important aspects of acclimatization is the capacity of living systems to adjust themselves to the presence of poisonous substances. Acclimatization to poisons occurs in all living organisms from bacteria to man."

It appears that a more resistant microflora in paper and board mills might develop in one of two ways. First, among the many species of microorganisms which were present during the initial period of satisfactory control, only a few of them might have been naturally more resistant to the disinfectant. Hence, during this initial period of control the less resistant and more numerous species would have been either killed or inhibited from growing. As time went on, the more resistant species would have become the predominant ones and, therefore, relatively numerous, which would explain the unsatisfactory bacteriological control. Second, a more resistant microflora might have developed by a gradual increase in resistance to the disinfectant by those microorganisms which possessed initially a very low resistance to the disinfectant. It may have been that some individual microorganisms possessed the ability to become acclimated, whereas others did not possess this ability. At any rate, the acclimatization of a part of the microflora would account for the failure to maintain satisfactory bacteriological control.

A series of experiments was initiated at The Institute of Paper Chemistry in February, 1942, for the purpose of determining the effect of sublethal concentrations of disinfectants upon a given species of bacteria. *Aerobacter aerogenes* was selected as the test organism because it is so frequently encountered in slime. Sodium pentachlorophenate was selected as the first toxicant to be studied, since it is the toxic agent in several important commercial disinfectants such as Dowicide G, Nalco 21, and Santobrite. The last-named was used in this investigation.

The first step in the acclimatization series was to determine the concentration of sodium pentachlorophenate which would completely inhibit growth of each isolate and the parent culture. The lowest concentration which completely inhibited growth in most cases was 0.03 per cent; however, in one case, 0.02 per cent was the lowest.

Having determined this initial resistance, the next step was to attempt to increase it—i.e., to acclimate the cultures to grow on significantly higher concentrations of Santobrite. At first, each isolate and the parent were cultured on standard nutrient agar containing 0.01 per cent of Santobrite by weight. After one week of growth on this medium, transfers were made to standard nutrient agar containing 0.02 per cent of Santobrite by weight. Thus, each week a transfer was made to a concentration of Santobrite which differed from the preceding one by 0.005 per cent.

Table I gives the concentrations of Santobrite which inhibited growth for the 11 isolates and the parent.

This range in ability to become acclimated may be attributed to inherent differences between the original single cells, which in turn transmitted this ability to their respective progenies. There were a few minor changes in the physiological characteristics of certain acclimated isolates. Much more significant, however, were changes in cell size as acclimatization proceeded. Whereas the normal variation in cell size of *A. aerogenes* is 0.5 to 0.8 micron in diameter and 1 to 2 microns in length, extremely long cells of larger diameter than normally found were observed in many instances. In some cases, the cell length was 25 microns and the diameter was somewhat greater than that of normal cells.

Table I—Concentrations of Santobrite in Media Inhibiting Growth after Maximum Acclimatization

Culture	Concentration of Santobrite % by weight
Isolate 1	0.130
Isolate 2	0.165
Isolate 3	0.105
Isolate 4	0.050
Isolate 5	0.165
Isolate 6	0.235
Isolate 7	0.220
Isolate 8	0.125
Isolate 9	0.120
Isolate 10	0.235
Isolate 11	0.060
Parent	0.055

The permanence of this acclimatization has also been studied. During the various experiments in which isolates were subcultured on specific concentrations of Santobrite to which they had become acclimated, parallel cultures of these acclimated isolates were subcultured on standard nutrient agar (without any Santobrite). In every case observed, it was found that several weeks of successive transfers to standard nutrient agar caused the isolate to return to normal size and, more significant, to lose its acclimatization to the concentration on which it had been growing.

The relative toxicity of chemical disinfectants can be obtained by the flask method (Appling, J. W., and Shema, B. F., Relative toxicity of materials recommended for slime control, *Paper Mill News* 65, No. 35: 14, 16, Aug. 29, 1942). The test organism used was *A. aerogenes* which, incidentally, was the parent culture employed in the present study. The flask method was used in the case of Isolate 7, after it had been acclimated to grow on 0.20 per cent Santobrite to determine whether its resistance was really greater than that of Isolate 7 which had not been acclimated. The results appear in Table II and show clearly that the acclimated culture had a much higher resistance than the nonacclimated one.

The evidence for acclimatization of *A. aerogenes* to Santobrite or, more specifically, to sodium pentachlorophenate, is completely convincing for a number of the isolates used in this study. This implies that some cases of unsatisfactory bacteriological control in paper and board

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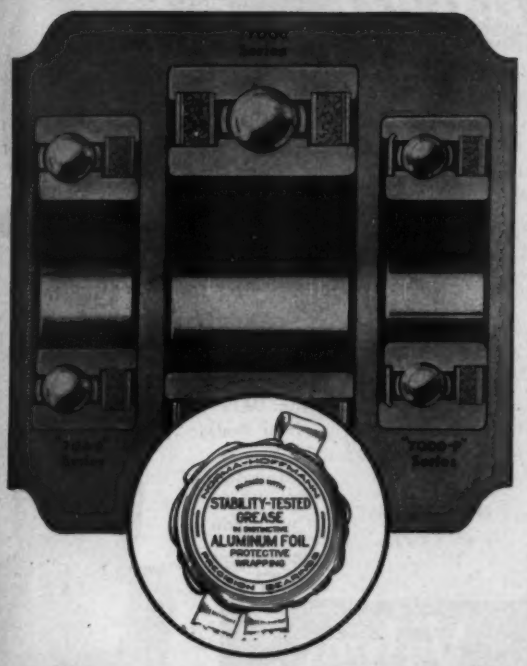

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Table II—Relative Resistance of the Same Isolate to Sodium Pentachlorophenate

Time Interval (min.)	Concentration, per cent by weight 0.10		0.20		0.30		0.40	
	7x	7	7x	7	7x	7	7x	7
30	+	+	+	+	+	—	+	—
60	+	+	+	+	+	—	+	—
120	+	+	+	—	+	—	+	—
180	+	+	+	—	+	—	+	—
240	+	+	+	—	+	—	+	—
300	+	—	+	—	+	—	+	—

7 designates Isolate 7 which has never been on media containing sodium pentachlorophenate.

7x designates Isolate 7 after being acclimated to grow on the 0.20 per cent concentration of sodium pentachlorophenate.

mills may have resulted from acclimatization of certain bacteria to the disinfectant by long and continuous exposure to sublethal concentrations. After acclimatization has occurred, the disinfectant would become ineffective. It has been emphasized that the acclimatization of *A. aerogenes* to Santobrite is conditioned by continuous exposure to the sublethal concentrations, which implies that intermittent exposure may be a more effective way of using the disinfectant in the mill. It may be better to discontinue the dosage of the disinfectant completely for several weeks and then to resume its use. In the meantime, if necessary, a second disinfectant may be employed to advantage because preliminary studies at The Institute of Paper Chemistry have shown that acclimatization to one disinfectant does not insure acclimatization to a completely different one.

Problems of the Government Printing Office

A. E. GIEGENGACK
Public Printer of the United States

Will it impress you to know that in this Global War you, as paper manufacturers, are engaged in a life-and-death struggle? This statement is supported by the verbatim transcript of a conference held in my office with high-ranking officers of the War Department, in which these officers brought sharply to my attention the fact that your failure and mine to give the War Department the needed printed field and technical manuals, forms, and so forth, would result in delaying invasions, in holding up campaign plans, and in slowing down attacks, and in greater loss of life through confusion and inadequate training, because these manuals and instructional forms would not be received in time to permit sufficient training and official direction of your own and our next-door neighbor's boys, who have grown up in our midst, and who are now giving their very lives in order that our American mode of life may endure.

Do you consider any commercial account more important than a book which teaches your boy how to navigate his plane over the wide waters of the globe or how to operate his other up-to-the-minute equipment?

We feel that there has been some misunderstanding about the essentiality of paper for the Government Printing Office. Statements which have been made indicate to us that many think that when the Government Printing Office attempts to purchase paper it is for the use of the Office. Nothing could be farther from the facts. The paper bought by the Government Printing Office is used in printing jobs for the Army, Navy and other agencies of the United States Government. In fact, 90 per cent of our present production goes directly into the conducting of the War. The requirements of the Government Printing Office for paper for its own use do not amount to one-hundredth of 1 per cent of the paper purchased.

For sometime there has been under consideration a program which would centralize the purchase of paper for the Government. If and when this materializes the various branches of the Government buying paper would not be competing with each other in an effort to get paper to meet the demands made upon them. It often happens that the Government Printing Office is in the market to purchase a large quantity of paper to print a job urgently needed by one of the war agencies at a time when that war activity is also in the market trying to purchase a large quantity of the same grade of paper. If the purchase of paper were centralized this would not happen.

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Fig. 0417—Iron Body, Bronze Mounted. Fig. 0418—All Iron

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The Government Printing Office, as large as it is, is not able to produce the vast volume of printing needed by the Federal agencies to carry on the war effort. For this reason, and under one of the amendments to our Basic Act, we started buying printing from commercial printers in August, 1940. In the fiscal year 1941, the printing thus procured from commercial printers amounted to approximately $2,000,000 and in the fiscal year 1943, it increased to approximately $25,000,000. In addition to the $25,000,000 worth of printing and under another amendment, I authorized, in the fiscal year 1943, the several Federal departments and agencies to make direct purchases of printing amounting to over $11,000,000.

These figures represent the cost of printing and binding only, as all paper, plates, and other materials necessary to produce a job are, in the great majority of cases, supplied by the Government Printing Office and are not included in the figures quoted. Taking this into consideration, the commercial value of the printing placed by the Office with commercial printers throughout the United States reached the sum of approximately $50,000,000 for the fiscal year 1943 alone, or $61,000,000, taking into consideration the $11,000,000 worth of printing released to other agencies. Contracts for this printing have been scattered throughout the 48 States, and approximately 1,300 contractors in 288 cities shared in this work.

We handle in the Government Printing Office itself approximately 100,000 jobs a year. It is not uncommon to find at one time from 10,000 to 15,000 jobs in some state of production in the plant, or in some stage of planning for commercial procurement .In my endeavor to give you a clearer picture of your responsibility and mine, in the war effort, with particular reference to these 100,000 jobs, let me cite a few illustrations as to what they represent.

The War Department averages over 600 requisitions per month for books and pamphlets alone, training and field manuals, army regulations, and so forth. These books and leaflets total over 40,000,000 copies per month and range from 2 pages to 300 pages each.

Some reprint orders for manuals involve 1,500 or 1,600 requisitions in a period of twelve to fifteen days and require from 12,000,000 to 13,000,000 pounds of paper. One example will suffice: The Soldiers Handbook, that foundation stone of every rookie's training, ran into over 7,000,000 copies in the last twelve months. This book contains 264 pages and required a total of 3,592,726 pounds of paper in its production.

In addition there are thousands of different forms for the Army ranging from tickets for the repair of shoes, through medical forms, to pilot's examination papers.

Navy work follows the same pattern as that produced for the Army.

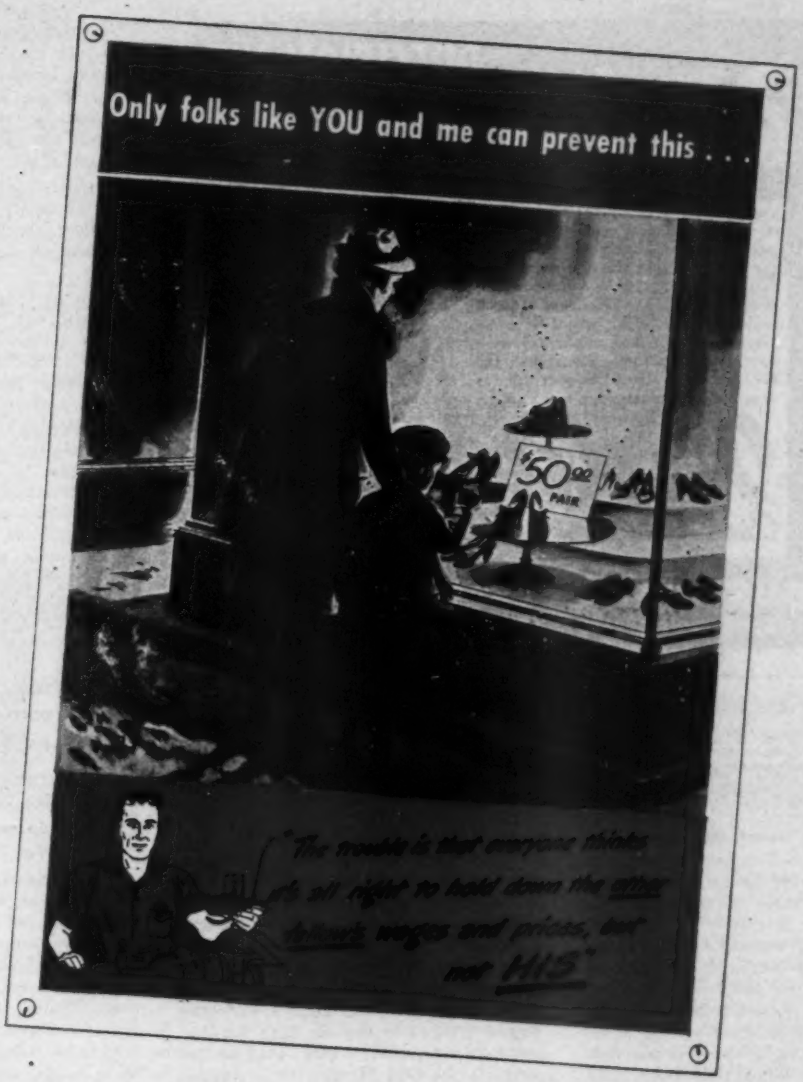
I repeat, probably 90 per cent of our work is directly related to the war effort, and the remaining 10 per cent ties in, if followed back a few steps. For instance, a census report on population may seem unnecessary, but it was used as soon as available by many agencies in the development of important programs, such as rationing, housing, transportation, war-loan drives, and so forth.

Who can say which is the most important, a field or training manual, a naval code for use in the convoys, the agriculture program that is to produce the food to feed the world, or the war-loan program to raise the necessary funds They all combine into our total war effort — Victory!

Surely everybody has heard why the Third War Loan program is on. It required 6,500,000 pounds of paper. Does anybody question the importance of this Government Printing Office order?

Every job placed with the Government Printing Office has a definite date of delivery fixed by the Ordering Agency as the date on which it must have the printing in order to carry out its program. We lay the plans necessary to make delivery of the job on time, but lately in many instances the Ordering Agency was handicapped and our war effort was hindered by our failure to deliver on the date fixed, and we were greatly embarrassed because the paper mill had failed to deliver to the Government Printing Office or to the commercial printer in accordance with their promise to us.

Very often when a mill is called upon to explain a delay in the delivery of paper, the statement is made that orders having "higher priorities" had to be manufactured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That's why we have the OPA and ceiling prices. That's why we have roll-backs. That's one reason we have War Bond campaigns. That's why we have salary, wage and rent freezes. That's one of the reasons for boosting taxes. That's why we have restrictions on installment selling.

The greatest weakness in the fight against inflation is that everyone thinks it's all right to hold down the other fellow's wages and prices, but not his.

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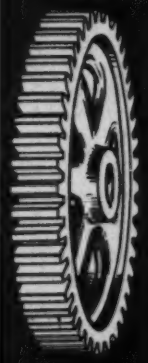

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in advance of the order from the Government Printing Office. On the other hand, we have been told time and again by the War Prduction Board that no priorities have been issued in connection with the manufacture of paper.

The war effort is not confined entirely to the battlefield. The internal economy of the country must be controlled. One phase of this control is rationing. To gear properly the machinery of rationing, it is necessary that enormous quantities of printed matter be produced. A total of over 4 billion forms and books, requiring approximately 75 million pounds of paper, were produced in the fiscal year of 1943. This quantity is not so large if one considers that these forms and books reach and affect every person in the United States.

Few people realize the enormous task of printing—for every person in the United States. The ration-coupon accounting, through the banks, required 300 million envelopes for use in turning stamps in at banks, or 4,400,000 pounds of paper stock were used in a phase of the rationing program little known to the general public.

The importance of the work of the Treasury Department in connection with the war needs no explanation, but let us note how, as a result of the war, the tax program has grown. In May of this year, we were asked to print 7 forms totaling 326 million copies, delivery to be completed by June 15th. These forms helped set up the procedure for the present tax-withholding program. Following that, the Treasury Department requested the Government Printing Office to print and deliver an additional 215,280,000 forms by August 15th, to be used in filing the September reports. Our present program for returns to be filed March 15th is really a husky one. It calls for 32 forms, about 800 million copies, requiring approximately 8 million pounds of paper, the greatest part being chemical wood writing paper. This program means 200 cars of paper that will ultimately reach every community in America, almost every family, and it is up to us to get that paper in the hands of the printers within the next four weeks.

To sum up the obstacles and problems that must be surmounted and solved if we are to do the job that faces us: Briefly, the reasons so far for our failure to receive from you the paper we need, in the time we need it, are, I believe, the following:

(1) The delaying of our orders by the filling of orders which the mills are led to believe are more essential; (2) The manpower shortage; and (3) The shortage of pulp.

There have been reports of other reasons why our orders are not accepted. One of these, which I am reluctant to believe, is that some of the mills refuse our offerings because they feel that there is more profit in the commercial business. If that feeling does exist in any quarter, I sincerely trust that now, with a clearer appreciation of the vital need for the paper we ask you to supply us, and the part that that paper will play—not only in strengthening the hands of those who are defending us on the battle fronts—but also in the fight against inflation and chaos in our home economy, no one of us will put personal gain or profit above the opportunity to serve our country.

Substitution and Conservation—the Role of Paper in the War

ROBERT J. ZAUMEYER, Chief
War Products Development Section
Pulp and Paper Division
War Production Board

In the mobilization of American industrial effort for total war after Pearl Harbor, the neglect of the paper industry was due to many factors but, in a large measure, to the lack of understanding of the high essentiality of paper in a war economy. Today, we find that paper is no longer a raw, untrained recruit but a tried and tested war veteran, impressive with service stripes. The old adage has been conclusively demonstrated that "paper is a substitute for many things but there is no substitute for paper."

The War Products Development Section of the WPB Pulp and Paper Division was organized in August, 1942. Its purpose was to encourage and facilitate the development of pulp, paper and paperboard for

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war uses and as a substitute for critical materials. With the help and guidance of its advisory committee, the Section has handled 46 projects in a formal manner. Several hundred other items have cleared through the Section.

Let us explore some of the more important substitutions that have taken place during this spectacular period of transition.

A realistic analysis of the lumber supply indicated that there would not be enough lumber, available for boxes and crates to take care of the shipping needs in this global war. Our industry stepped into the breach and came up with the now familiar V box.

The specifications calling for a dry Mullen test of over 750 pounds and a wet Mullen test of over 500 pounds after submersion for more than 24 hours, enables this container to withstand exceedingly rough handling. The contribution of the waterproof adhesive, namely urea formaldehyde and starch must be duly credited.

In recent weeks reports of corrosion of tin cans packed in V boxes have reached Washington. Prompt investigation indicated the need for more accurate moisture control. It also indicated that asphalt barriers were desirable. These problems are typical of the tremendous trifles which usually follow a new development but are readily resolved by better control and careful supervision of details. The V box program has been conservatively estimated as being equivalent to conserving 1500 carloads of lumber per month.

The TNT shipping box has also been converted from wood to paperboard, and it is reported to be equal to three round trips from explosive to shell-loading plant.

One outstanding development has been the substitute for steel shipping bands to protect bombs in transit to battle fronts. The new type band, which was developed by an aggressive paperboard manufacturer in conjunction with the Ordnance Department, utilizes laminated sheets of reclaimed fiber. It will conserve well over 50,000 tons of steel yearly. The impact strength of the paper bands exceed those designed of steel and they do an equally good job of protecting the outer surface of the bomb in handling.

As a substitute for light-duty steel strapping, various types of paper straps have been developed. They have proved suitable for binding light-weight bundles and boxes, and for the baling of packages and commodities weighing up to approximately 90 pounds. In some instances, existing tension tools have been adaptable. One type, a laminated product, permits selective tensioning and exhibits excellent tensile strength. Two hundred thousands tons of steel is normally used in the manufacture of steel strapping annually and roughly one-half of this amount can be conserved by use of the paper strap.

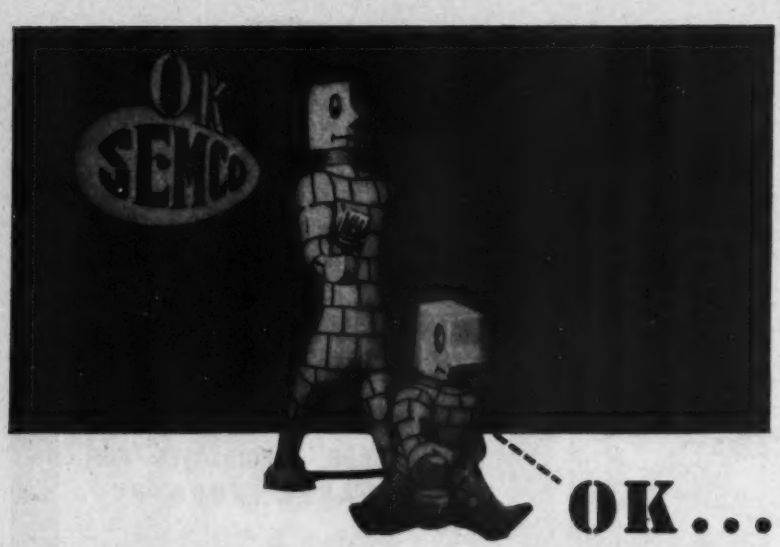
An ingenious development of laminated paperboard has been evolved and approved by the Insurance Underwriters for hot-air ducts conserving valuable tin plate. Both the inner and outer surfaces are lined with asbestos. The corrugated center improves its insulating properties. Conservation estimates reach up to 75,000 tons of metal saved per year.

The molded fibre industry can be credited with creative progress in metal conservation. Flash-light cases, alarm-clock cases, walky-talky battery cases, special canisters and instrument cases are typical end uses. The application of phenolics to pulp preforms enables them to be used for structural parts. They possess good mechanical and physical properties and are easily molded. The application of mass production methods to the process has reduced over-all costs.

Even the Carlisle First Aid package with its sulfadiazine tablets, has been taken out of a steel container with its rubber gasket, and is now packaged in laminated paper and foil with more satisfactory results.

An extremely meaningful development in the interest of conserving steel is a specially impregnated paper-liner cotton duck bag, having a capacity of 7½ gallons, for the conveying of high-octane aviation gasoline. The design involved some unique engineering technique. This bag weighs only one-third as much as the steel blitz can and withstands higher internal pressures. It is more saving of space and will take more abuse.

An invaluable technological development is the paper printing plate, which is used in certain duplicating processes and is capable of handling as many as 50,000 reproductions. The plate lends itself to half-tone, black and white, and color printing. For lithograph printing a special sheet



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is coated with certain plastic materials.

The multiwall paper bag has taken on tremendous responsibilities in this war and can be credited with a grand conservation job. It has replaced critical burlap, cotton, wood, and metal containers in the handling and shipping of many commodities.

The bags are scientifically constructed to meet all types of exposure and abuse. Asphalt laminated plies are generally used for water resistance and within recent months, paper plies, resin treated for wet strength, are also being employed. Certain constructions have resisted complete submersion in water for 24 hours.

Fiber drums are also meeting a need for certain commodities and are replacing metal drums.

It is estimated that in the folding box field approximately 175 different types of packages have been developed for direct war uses or to replace metal, Pliofilm, rubber and cellophane containers. In savings of metal alone these conversions would approach 125,000 tons per year.

In the field of cylindrical containers for lubricating oil and paint, we have a conservation of about 90,000 tons of metal. The tobacco packages have all been converted from metal to paper. That includes the 2, 8 and 16 ounce sizes and represents a saving of 40,000 tons of steel.

Modern warfare required durable maps for land, sea and air. This type of map paper is now being produced by applying wet-strength techniques.

The Army and Navy is having many of its manuals and charts printed on high wet-strength paper to extend their usefulness under all conditions of exposure. One manual of particular interest serves as a food guide for our aviators who have bailed out over tropical jungles. It describes and illustrates edible insects and vegetation, and also the poisonous varieties. It gives other valuable data that enable the lost or stranded soldier to save his life to fight again. High wet-strength paper in this booklet is a "must" to enable it to "swim" through a jungle stream, a tropical downpour or a salt-water bath.

Lens papers are made possible through wet strength resins. Their strength and lint-free properties are enhanced. Photographic papers are now being resin-treated to improve their properties. Camouflage paper, in its task of garnishing gun emplacements and other strategic locations, must be prepared for prolonged exposure to weather by wet strength. Glassine for certain food packaging has been improved by resin treatment. The outer wall of multiwall paper bags is definitely bettered by wet strength.

The synthetic-resin treatment of paper also improves many of its dry properties, notably fold endurance and that fact will ultimately be applied to certain technical papers in the interest of longer life.

Certain new synthetic resins are now being considered and tested, one in the alkyd and another in the acrylic class.

An invasion of great significance to our industry has been the development of the high-strength paper base laminates cured at low pressures. It is reported that the design of a wing structure for a trainer-type plane of this material is now in progress. Their rivetless construction at lower labor cost makes them very attractive.

Lignin laminates are replacing aluminum pattern plates and are finding some application in electrical devices where they substitute for more critical materials. These laminates are also being used to substitute for critical Masonite. The development is receiving further study and improved physical qualities are possible by the appli-

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cation of a phenol-impregnated surface sheet.

Lignin is also being marketed in molding compounds by a large plastic manufacturer as an extender of very critical phenol.

Problems of greaseproofness, water-proofness, flexibility, protection against light and moisture vapor transmission have called for technics that were secured by laminating, coating and impregnating. Components, including kraft paper, cellophane, glassine, metal foil and plastic films with various types of wax, thermoplastic resins and asphalt compounds are serving a great cause. Our Section has helped in this development.

You are all familiar with the jettison gasoline tanks that serve our fighter planes so well in extending their fighting range. These "drop" tanks also enable the smaller planes to fly over the oceans to battlefields, saving cargo space and valuable time. How many of you knew that most of these tanks are now being made of vulcanized fibre, a product of our industry.

The tough, flexible and wear-resistant properties of vulcanized fibre have also made possible the rather famous elastic stop nut used so widely on aircraft and other equipment.

Paper is alternating for textiles. A dramatic application is the paper parachute. There are three types: namely, the flare chute used for aerial reconnaissance, the radio sonde chute used for weather observation, and the cargo chute which is presently being developed for heavier loads and higher plane speeds.

Paper vests have been produced with excellent thermal insulating properties. They have been used in aviation training in this country and are being considered for other services.

A gas cape made of specially impregnated paper has been accepted as proof against blister type war gases for our troops. It is equipped with a transparent window. The cape is slipped over the soldier's head and gives him complete protection against gas.

Due to the shortage of burlap and osnaburg, paper was called upon to serve in the field of camouflage. Specially impregnated kraft paper having a high wet strength and a rough irregular surface makes a very satisfactory garnish. Fastness to light, infrared reflectance, flexibility, mildew resistance and color retention were necessary and were adequately met.

The hard-fibre segment of our industry has been called upon to supply an alternate for very critical Manila rope in one important application. Both the Army and the Navy used a Manila rope grommet as a protecting device for the rotating bands of their shells. The Navy has adopted a grommet fabricated out of hard fibre which is expected to give even better protection to the rotating band than Manila rope. In the case of the Army, an asphalt impregnated sheet functions as a cushioning agent in the design of their grommet.

The Cordage Section of WPB would like to be able to count on us for at least 50,000,000 lb. of paper twine per year, suitable for use in comparative sizes ordinarily made of sisal and jute.

Industrial wrapping twines are used for a variety of important purposes. In 1941, the paper trade, largest consumer of wrapping twine, used 35 per cent of the total. The printing trade, second largest consumer, used 18 per cent.

Part of this shortage must be taken up by twisted kraft-paper twine.

This is the first war in which leatherboard has been accepted by our Army for use in G. I. shoes. The components now approved are the counters and shanks. These cannot be termed substitutes because they represent a definite functional improvement over leather.

A Neoprene conservation has also been accomplished in delousing bags for the soldiers' clothing by the substitution of an impregnated paper liner in the construction. This liner is proof against methyl bromide that is employed in the treatment.

The industry has made possible many conservations in other fields and must now help itself by extending the use of reclaimed and substitute fibres wherever possible in grades that are low in the essentiality ladder. More sacrifices must be made in the quality of many grades. Even our currency paper has substituted American flax for Irish linen.

An interesting example of what can be done with waste material is the development within the wet machine board industry. Several mills are producing various types of substitute hard boards and asphalt impregnated boards having a fibrous furnish entirely of waste material. The former is being used for wallboard and the

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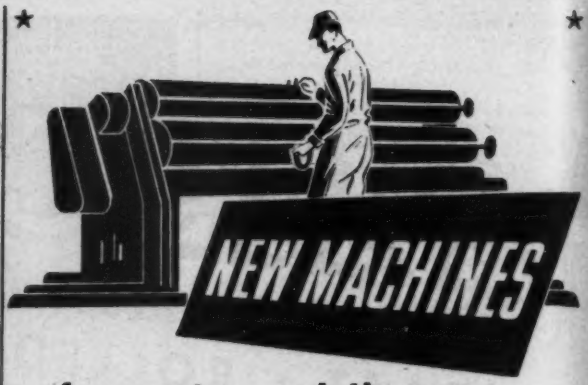

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It might be well to do a little thinking and planning about these requirements right now!

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latter is being used for weatherproof shipping cases as a substitute for plywood and as a lining for airplane motor wood cases to make them suitable for reuse.

As soon as wet strength resins came into general use, it was apparent that work would have to be done immediately to reuse the waste which was cluttering up beater rooms and warehouses. This is especially necessary in the present situation with the shortage of fibrous material. Our industry has cooperated with the resin manufacturers and progress can be reported. The waste is reclaimed through the use of steam, alum and mechanical action. Hydrapulpers have done a creditable job in furnishing severe mechanical agitation. Ordinary broke beaters can also be used but large sheets must be shredded first. Rag cookers, if available, help to soften the resin for the broke beater to speed the process. These developments represent a start, and refinements can be expected.

From the standponit of substitution and conservation our Section has also studied the casein, starch and microcrystalline wax problem. The casein substitutes suggested are alpha protein, starch, glue and soya bean protein. It is probable that the urea resins will also be used in certain grades. The corn starch position has eased somewhat but for the long pull a deficiency in supply can be programmed. Special processed wheat flour is playing its part in this substitution program. The emphasis, however, must be on conservation in view of the overall food problem. Our industry is serving this cause in supplying lignin binders as a substitute for corn-product adhesives to the large foundry industry.

The microcrystalline wax situation for the fourth quarter does not present a pleasing picture. Some additional capacity can be expected in the medium grade substitues, and here again the use of the substitutes should be enforced.

One unique conservation measure that can be credited to the paper industry is the reclamation of helmet liner scrap. The Army plastic helmet liner is fabricated from cotton duck impregnated with critical phenolic resins. In tailoring the helmet liner, there is approximately 25 per cent waste in die cutting. In an attempt to conserve this scrap, a progressive paper manufacturer found it possible after shredding the material, to process it with regular papermaking equipment and produce a sheet of phenolic-filled rag paper that is plastically moldable. A minimum amount of this original phenolic content was lost in the process. It was also found possible to fortify this sheet with low pressure resins to lend added serviceablity. This material has been used as a surfacer for plywood for various Army uses and it is also adaptable to aviation munition boxes, trays and similar applications.

The industry must not say or even think that it is using all the waste possible. We must start where we have left off. Virgin fiber is the choke point. Conservation by the extension of the use of broke and waste will be the order of the day.

The Pulping of Extracted Yellow Pine Wood Chips*

OTTO KRESS[1] and ROBERT H. MOSHER[2]

At the present time large quantities of naval stores are obtained by extracting stumpwood of southern pines with a volatile solvent, producing as a by-product so-called extracted chips.

After extraction, the solvent is drained off, and with it the dissolved resins, pine oil, and turpentines, as well as some pitch and other extractives. A large proportion of the solvent remains adsorbed or absorbed in the chips and, consequently, the unit is treated with steam for the recovery of this valuable solvent. Generally, over 99.5 per cent of the solvent is recovered. Following this treatment, the spent chips are discharged. Since in most processes there are approximately 4 tons of waste wood for every ton of resins and turpentine produced, there is a large potential by-product in this spent wood.

In 1918, Kress and Textor (*J. Ind. Eng. Chem.* 10:268-270, 1918) at the Forest Products Laboratory cooked the spent chips and concluded that the chips did not give a commercial pulp, mainly because of the degradation caused by the solvent recovery steaming process. A later investigation was carried on by Greenwood for Pine

*A portion of a thesis submitted by the junior author in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., May, 1942.

[1]Technical Director and [2]Student, The Institute of Paper Chemistry.

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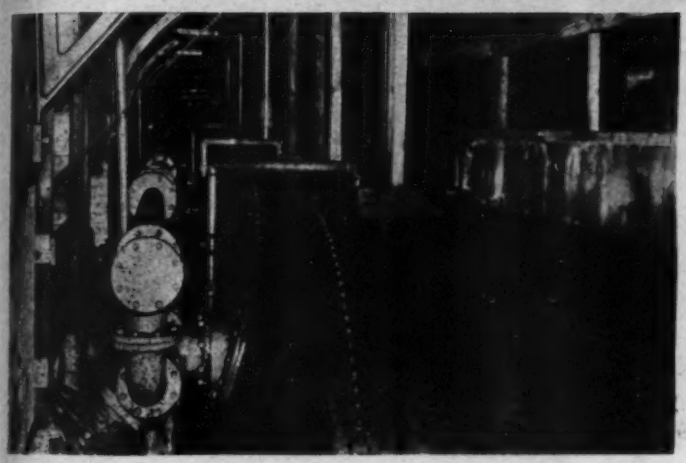

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Waste, Incorporated (Greenwood, F. E., *Paper Trade J.* 84 no. 5:60-64; no. 6:52-60; no. 7:43-48, Feb. 3, 10, 17, 1927), from which he concluded that the chips, after some modifications in the chipping and extracting processes, could be economically pulped. Although many investigators have worked on the problem of the utilization of the spent wood and considerable money has been spent in conducting research on its commercial possibilities, no organization has, up to the present, successfully produced a chemical pulp commercially which could compete with normal southern kraft.

The spent wood has been ground for the production of fiber suitable for roofing felt, insulating board, or similar products, and this industry flourished until the introduction of the Asplund and other defibrators. These made it possible for a mill to grind its own fiber from local waste cheaper than it could buy the defibered rootwood. There are still a few mills making insulating and wallboard which operate in conjunction with an extraction plant (Palmer, R. C., *Process industries flow sheets and data book.* New York, McGraw-Hill Book Co., 1940, p. 114-118), but very few of them utilize the total output of available spent chips.

Since this problem is related directly to the naval stores industry, it was desirable in the experimental work to use wood which had been commercially extracted.

A batch of solvent-extracted chips and a corresponding batch of unextracted chips were obtained through the courtesy of the Continental Turpentine and Rosin Corporation of Laurel, Mississippi. These samples were taken directly from the processed material and, therefore, are representative of it.

In order to eliminate some of the variables in the course of the investigation and to provide a material which was known to pulp normally, jack pine (*Pinus banksiana*) was chosen as a standard material. To duplicate as far as possible the treatment given the commercially extracted wood, a normal jack pine log was chipped in the Carthage chipper and the chips further passed through a hammer shredder. The material was then divided into two parts; one portion was stored as unextracted chips, and the other portion was extracted with a petroleum naphtha solvent (boiling point range of 205-238 Fahr.) in a large extractor, after which the chips were removed and air dried. A material was thus obtained which was known to give a normal pulp, of a chip size comparable to the rootwood, and a portion of which had been solvent extracted and air dried.

Solvent-extracted rootwood was cooked by the kraft process under conditions which were varied over the commercial range, and in no case was there obtained an economic yield over 37 per cent based on the extractive-free material. The maximum yield only amounts to 30 per cent when based on the oven-dry chips, because there was 19 per cent of extractives in the wood.

Strength tests were made on representative pulps, and in all cases the maximum strength of the rootwood pulps was approximately 50 per cent of that of normal jack pine kraft pulp.

The low yield of pulp obtained from solvent-extracted wood by the kraft process is not due to the small chip size necessary

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to procure maximum extraction efficiency, the solvent extraction process, or the steaming to which the extracted chips are subjected for the recovery of the solvent.

The low yield of the pulp obtained from solvent-extracted rootwood by the kraft process is mainly due to the fact that the wood used in the extraction process is very much degraded even before solvent extraction and, therefore, is not an economic raw material.

The solvent-extracted and unextracted rootwoods seem to be similar to normal wood in chemical composition. However, the degradation tests, such as cuprammonium viscosity, copper number, and alkali solubility, show that the cellulose material is evidently degraded. Although the fibers are normal in size, their behavior on swelling, beating, etc., indicates that they are somewhat degraded.

The presence of extractives in the wood appears to cause a modification in the mechanism of cooking; woods containing large amounts of extractives gave lower yields of pulp with decreased strength properties, compared with extractive-free wood.

The poor strength qualities obtained in the solvent-extracted rootwood pulps are not due to the small chip size necessary to preserve maximum extraction efficiency or to the solvent-extraction process. The steaming to which the extracted chips are subjected for the recovery of the solvent has a definite degrading effect. The main reason for the poor strength is the inherent inferior strength characteristics of the original rootwood.

In a normal kraft pulp the hydration characteristics are generally associated with strength development. In the rootwood pulp, however, the fibers hydrate immediately upon contact with water but do not develop normal strength on beating.

A Comparison of Southern and Northern Kraft Pulps*

OTTO KRESS[1] and FRANCIS T. RATLIFF[2]

Through the courtesy of various mills, the following commercial pulps were received at the Institute:

1. Southern kraft from Louisiana; air-dried laps.

2. Southern kraft from Mississippi; air-dried laps.

3. Southern kraft from Georgia; machine-dried pulp roll.

4. Southern kraft from South Carolina; air-dried laps, very raw cook.

5. Northern kraft from Wisconsin; slush pulp, from balsam wood.

6. Northern kraft from Wisconsin; slush pulp, from jack pine wood.

7. Northern kraft from Wisconsin; slush pulp, from spruce wood.

(1) Technical Director, The Institute of Paper Chemistry, Appleton, Wis.; (2) Student, The Institute of Paper Chemistry. Present address: Esso Laboratories, Standard Oil Company of Louisiana, Baton Rouge, La.

*A portion of a thesis submitted by the junior author in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., May, 1942.

It was thought advisable to select, for the comparison, pulps which had received the same degree of cooking. For this reason, the permanganate number was determined for each of the seven pulps received. Pulps 1, 2, 3 and 7 had approximately the same permanganate number. Pulp 3 was discarded because it had been machine-dried. Beater evalution of the above-mentioned four samples showed that the machine-dried pulp was definitely weaker than the other southern kraft samples. Of the two remaining southern kraft pulps, the one containing the least amount of shives and other foreign material was selected. The pulps finally chosen were 1 and 7.

All beater evaluations of the two pulps were made in the same beater, one after the other, to eliminate any changes in the calibration of the instrument.

The complete physical evaluation of the two pulps showed the differences normally expected between a southern and a northern kraft pulp. The southern pulp hydrates and develops slowness in the beater much faster than does the northern pulp. The southern sheet has lower bursting and tensile strengths than the northern sheet; the tearing strength of the southern sheet is higher. The southern sheet is harder, has more rattle, and tends to be of wilder formation than the northern sheet.

The two pulps were analyzed for the various chemical constituents which might have an effect on the other properties. The chemical composition of the pulps was very similar. Therefore, it may be said that

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their physical differences are not caused by any difference in the chemical constituents for which they were analyzed.

The loss in tearing strength is approximately the same for both pulps at paper-making freeness when stored for a short time in a very dry atmosphere. Likewise, the permanent loss in tearing strength is about the same when these sheets are reconditioned after storing in a very dry atmosphere for a short time.

When comparing the values of the zero-span and normal-span tensile tests on sheets prepared from the two pulps, it is seen that the difference in the zero-span tensile strengths are not nearly as large as those found in the normal or 4-inch span tensile strengths. Because the zero-span test is intended only as a measure of the ultimate fiber strength, it may be concluded that the differences in tensile strength are not caused by variations in the ultimate fiber strength but by differences in the fiber-to-fiber bonding strength.

The northern pulp, with a given beater setting, required considerably more time to arrive at a definite freeness than the southern pulp, and undoubtedly more cutting action occurred. However, it may be definitely stated that, for a given treatment in the British disintegrator, more skin substance and fiber debris result from the southern than from the northern pulp. It would be expected that, in forming a sheet of paper from the beaten pulp, a large proportion of this material would be retained because of the flocculating action of size and alum. Being extremely hard and horny, it is conceivable that this material could contribute to the hardness and rattle of a sheet of paper. On drying a sheet, this debris might shrink faster than the fibers themselves and thus could be a factor influencing the loss of strength of a sheet of paper on drying. When this substance has been dried, it is practically impossible to wet it again. This behavior, therefore, could be partially responsible for the failure of a sheet of paper to regain all of its strength after drying and reconditioning.

The percentage of the specific surface area involved in fiber-to-fiber bonding in southern kraft paper is not as great as that involved in fiber-to-fiber bonding in the northern kraft paper. This would be expected from the fact that southern pulp has a higher percentage of summerwood fibers. These fibers do not collapse as easily as do the springwood fibers. It has been shown by Clark (*Tech. Assoc. Papers* 26:285-294, 1943), that the specific surface area for a northern pulp is much larger than that for a southern pulp. This would lead to the conclusion that the actual bonded area per gram of paper would be much less in southern than in northern pulp. Physical tests which give a measure of bonding strength do not indicate differences this great. It is entirely possible, then, that the actual strength per unit bonded is higher in the case of the southern than in the case of the northern pulp.

Possible Stream Pollutional Aspects of Mill Antiseptics

WILLIS M. VAN HORN, Research Assistant
The Institute of Paper Chemistry

A number of commercial compounds have been recommended for slime control, and the effectiveness of some of these has been investigated at The Institute of Paper Chemistry (Appling, J. W., and Shema, B. W., *Paper Mill News* 65. No. 35: 14, 16, Aug. 29, 1942).

Because the use of these reagents is designed to control the growth of living organisms and because they are introduced into the water systems of pulp and paper mills, it follows that some of the toxic material might find its way into the sewer and eventually into the stream. This presents the problem of whether such reagents in the mill effluent will set up a stream pollution problem, affecting fish and other aquatic forms in the waters into which the mill wastes are emptied. Under ordinary circumstances most mill effluents are quite rapidly diluted after reaching the river, and it seems probable that this dilution might dissipate the toxic agent quickly enough to prevent any ill effects. On the other hand, there are cases in which the rate of dilution of the effluent in the river is slow. In such instances, it would be of value to know to what extent the slime-control reagents could exist in a river and still remain harmless.

The Monsanto Chemical Company, manufacturers of Santobrite, early recog-

nized the possibility of a pollutional problem arising from the use of Santobrite in controlling slime in pulp and paper mills, and in 1939 carried out an investigation at the University of Illinois designed to develop fundamental information on the effect of that product on fish life. The results have been reported by Goodnight (*Ind. Eng. Chem.* 34: 868-872, 1942). Shortly thereafter (1940), the Monsanto Chemical Company made arrangements with The Institute of Paper Chemistry for an extension of this work to include the effect of mixtures of Santobrite and pulp and paper mill effluents on fish. The present results on Santobrite have been taken from the work done for Monsanto at The Institute of Paper Chemistry and are published with the permission of that company.

At the conclusion of the work on Santobrite a project was established by The Institute of Paper Chemistry for a study of various slime-controlling agents in use in pulp and paper mills, a project closely related to the study in progress on the relative effectiveness of these agents in controlling slime. (*Paper Mill News* 65. No. 35: 14, 16, Aug. 29, 1942.) This paper presents the first data gathered under this project. Further reports will follow as additional reagents are investigated.

Some fish (e.g., the carp) are quite resistant to environment changes, whereas others (especially some of those in the minnow family) are extremely sensitive. In this work, for the main part, the most sensitive of the local minnow fauna were used. These included the following species: the steel-colored or spot-fin shiner [*Notropis spilopterus* (Cope)], the blunt-nosed minnow [*Hyborhyncus notatus* (Rafinesque)], the lake emerald shiner [*Notropis atherinoides* (Rafinesque)], and the rosy-faced shiner [*Notropis rubellus* (*Agassiz*)].

The use of these minnows during the experiments depended on their availability at the time needed; it was not possible, therefore, to test any one reagent with all the species. The minnows were collected from a local stream by means of a glass minnow trap. The fish were immediately brought to the laboratory and stored for a period of about a week to allow them to become adjusted to laboratory conditions. Only healthy fish were used in these experiments.

In some experiments, frog tadpoles (*Rana pipiens*), goldfish [*Carassius auratus* (Linneaus)], and other fresh water forms were used as test animals. With the exception of the goldfish, the data for these forms resemble so closely the data for the minnows that they are not included in this paper. The data on the goldfish are, as yet, incomplete and will be reported at a later date.

In the progress of this work thus far, five reagents recommended by their manufacturers for the control of slime-producing organisms have been tested.

Table I gives the critical concentrations of these compounds for the species of fish which were tested. That is, any concentration which is above the level indicated will prove lethal sooner or later to that species of fish, under the conditions of the experiment.

As can be observed from the above data, Merfenel is the most toxic to fish of any of the compounds thus far tested and Nalco 23 the least so. The blank spaces in the table indicate that that particular species of fish was not available when the tests were made.

It is evident that very small concentrations of all these substances may be toxic to fish, although it must be borne in mind that, at the critical levels, the fish often remained in the test solution for many hours. It is doubtful if similar conditions would be duplicated under natural conditions. By the time the toxic substance became diluted in a river to 0.4 ppm, for example, it is probable that further dilution would occur at such a rate as to preclude the possibility of harmful effects upon the fish.

It is in the higher concentrations that

Table I—Critical Concentrations of Slime-Control Reagents in P.P.M.

	Critical Concentrations, ppm			
Reagent	Steel Colored Minnow	Blunt Nosed Minnow	Lake Emerald Shiner	Common Shiner
Santobrite	0.4	0.3	0.2	—
Merfenel	0.02	—	0.02	0.06
Lignasan	1.0	1.0	0.8	—
Nalco 23	1.4	1.4	1.4	—
Nalco 21	—	—	0.4	0.4

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the chief danger to fish is found. Fish placed in a solution of 5 ppm of any of the reagents tested will lose their sense of equilibrium within a few minutes and will show evidence of internal injuries which ultimately are the cause of death.

It appears that, from the standpoint of stream pollution, the use of the various slime-control agents would be conditioned by several factors:

1) The concentration necessary to be effective in mill operation.

2) The extent to which the slime-controlling agent is adsorbed by the pulp fibers and, hence, does not appear *in toto* in the mill effluent.

3) The magnitude of white water and other water loss to the sewer, and

4) The amount and rate of dilution occurring after the mill effluent is emptied into the stream.

Under the conditions of normal mill operation, if the mill is located on an average sized stream, it seems unlikely that lethal concentrations of these slime-control agents would exist in the river over a very large area. It is possible, of course, that conditions dangerous to fish might occasionally exist in the immediate vicinity of the mill effluent, but stream dilution should quickly remove this danger. On the other hand, if by accident, the concentration of these agents is raised in the effluent, it is conceivable that for a time fish life might be menaced for a considerable distance from the effluent.

This investigation is being continued at the Institute to determine the toxic qualities of other slime-control reagents.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933.

Of The Paper Industry and Paper World, published monthly at Chicago, Illinois, for October 1, 1943.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared A. Scott Dowd, who, having been duly sworn according to law, deposes and says that he is the business manager of THE PAPER INDUSTRY AND PAPER WORLD and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editors, and business managers, are: Publisher, Fritz Publications, Inc., 59 E. Van Buren Street, Chicago, Ill.; Editor, Besse Merrithew, 59 E. Van Buren Street, Chicago, Ill.; Editorial Director, Harry E. Weston, 59 E. Van Buren Street, Chicago, Ill.; Business Manager, A. Scott Dowd, 59 E. Van Buren Street, Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Fritz Publications, Inc., 59 E. Van Buren Street, Chicago, Ill.; Mrs. Annie C. L. Fritz, 6801 S. Crandon Ave., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mail or otherwise, to paid subscribers during the twelve months preceding the date shown above is .....
(This information is required from daily publications only.)

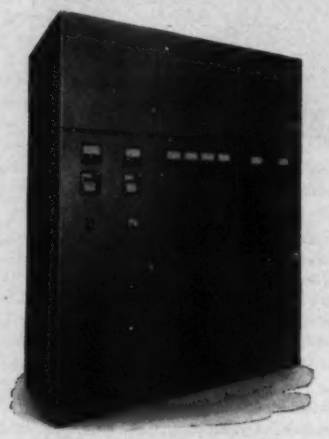
A. SCOTT DOWD
(Signature of business manager.)

Sworn to and subscribed before me this 30th day of September, 1943.
[SEAL] THOMAS H. STEVENS, Notary Public
(My commission expires June 24, 1947.)

NEW EQUIPMENT AND SUPPLIES

Motor Starter

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has announced the Type H motor starter which has been developed for both induction and synchronous-type motors, rated up to 100 hp. at 2300 volts and 1750 hp. at 4600 volts, 3-phase, 60 or 50 cycles. The starter is a metal-enclosed structure similar to metal-clad



switchgear. It utilizes high interrupting capacity disconnecting-type fuses in combination with a heavy duty oil switch. Fuses operate only under actual short circuit conditions, and will not blow unnecessarily.

The uses of the starter cover full or reduced voltage starting, dynamic braking, reversing, and special applications.

Vibration Absorber for Tubing

A vibration absorber for stationary or movable tubing has been announced by Packless Metal Products Corporation, New Rochelle, N. Y. Known as the *PACK-LESS Flexible Fastener*, the item consists of a sensitive spring, cone-spiraled and terminating in a clip which snaps on to the tube or similar unit to be fastened—the right size fastener being chosen to fit the O.D. of the unit. Fasteners can be installed in either lateral or vertical positions.

According to the manufacturer, the fastener, when used to support flexible hose, prevents whip; and, when used with copper tubing, prevents crystallizing of the copper.

Plastic Surface Worm Roll

Rodney Hunt Machine Company, Orange, Mass., has announced a spreader roll with a body of wood covered with special plastic, and with a spiral winding of rubber that goes left and right from the center.

The shafts of the roll are anchored by the patented *Shaf-tite* head construction. A 6-inch diamater body is the most common size of the roll.

Chemical Stoneware Resists Thermal Shocks

A chemical stoneware that will resist violent thermal shocks has been announced by The U. S. Stoneware Company, Akron, Ohio. Known as *Ceratherm 500*, it can be heated by direct steam or hot gases, and

then cooled quickly. According to the manufacturer, *Ceratherm 500* actually increases in strength when heated to 400 Fahr. and quenched, and shows no loss of strength after repeated heating to this temperature and cooling.

All-Purpose Motor

Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill., has announced an all-purpose, continuous-duty, polyphase squirrel-cage induction motor which is equipped with a centrifugally-cast rotor, and with ball bearings sealed in cartridge type housings. The frame is cast in one piece with rib sections to give added strength. Cross-flow ventilation, a feature in frames 224 to 365 inclusive, is obtained through protected inlets and exhausts at each end of the rotor.

Where space is limited, the conduit can

be brought up between the motor feet to the tapped hole in the motor frame and the conduit box cover assembled flush with the frame. The external box is then discarded. When the conventional conduit box is used, it can be mounted in any one of four positions.

The motor is rated 40-C and is designed to carry 115 per cent load continuously without injurious heating (1.15 per cent service factor).

Safety Seal for Fire Extinguishers

The General Detroit Corp., 2272 East Jefferson St., Detroit 7, Mich., has announced the *General Safety Seal* for use as a protection against fire extinguisher tampering. The seal, constructed of heavy water-repellant stock, is made in three

standard designs. Foam and soda extinguishers are protected by a stitched envelope which slips over the hose and fastens around the control valve. Vaporiz-

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ing liquid extinguishers are fitted with two caps, one covering the pump end and the other protecting the nozzle. Carbon dioxide extinguishers are guarded by a cup-type envelope which fastens tightly over the nozzle horn. All protective envelopes or caps are held in place by a tamper-proof wired seal. The envelope cannot be removed or the extinguisher used without breaking the seal—thus protecting the extinguisher against tampering.

Combination Mercury and Incandescent Lamp Dome Reflector

Revere Electric Mfg. Co., 2949 N. Paulina St., Chicago, Ill., has announced a reflector unit, utilizing an incandescent lamp in combination with a mercury lamp, to meet the need for illumination approaching daylight on both flat and vertical surfaces. The reflector, shaped to give wide, even distribution of light with a minimum of direct glare, together with the hood, is designed to dissipate heat accumulated from the lamps. Both the hood and reflector are of heavy gauge steel porcelain enameled white inside and green outside. The mercury lamp is of 250 watts; the incandescent, 300 watts.

According to the manufacturer, this unit offers excellent possibilities wherever light of more natural color rendition is desired, especially where heavy equipment is in use or where colored materials are being hand'ed or manufactured.

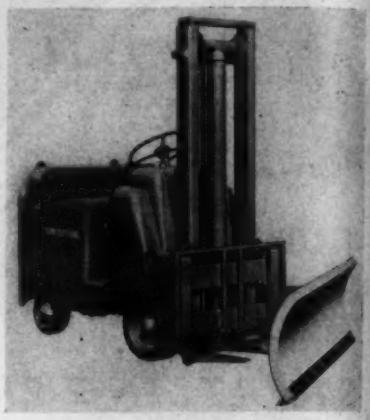
Synthetic Rubber Mountings

The B. F. Goodrich Co., Akron, O., has announced that its line of *Vibro-Insulators* (rubber mountings) can be made of Ameripol synthetic rubber. Whether made of natural rubber or synthetic rubber, most all of the mountings are designed to carry the load in shear, rather than in compression, to take advantage of much greater resiliency. Among the advantages of these mountings, cited by the manufacturers, are: Reduce wear and tear on machinery; eliminate noise and vibration that is distracting to production and office personnel; and prevent eventual structural weakening or destruction of buildings.

Snow Plow Attachment For Lift Truck

Towmotor Corporation, 1226 E. 152nd St., Cleveland, Ohio, has announced a snow plow attachment for mounting on Towmotor's standard fork-type trucks. The blade of the plow is of high carbon steel, and it is inclined at such an angle that it rides over ordinary road obstructions.

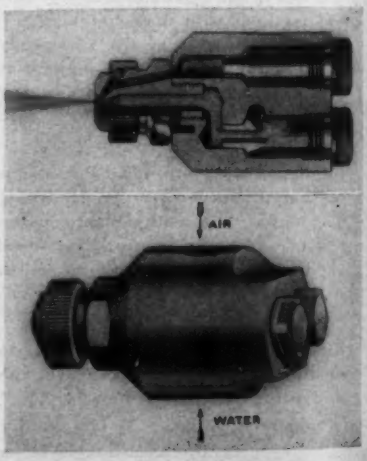
The model illustrated has a 23 in. high moldboard, is 64 in. in overall length, and has a plowing width of 53 in. at extreme angle setting. The plow also is available in spring-trip models, and in greater widths.



Mounting of the attachment consists merely of positioning and tightening a set of two-bolt draw clamps. No adjustments, other than setting forks at maximum width, are necessary.

Pneumatic Atomizing Nozzle

A pneumatic atomizing nozzle for humidification systems has been developed by Spraying Systems Co., 4021 West Lake St., Chicago, Ill. In this nozzle, designated as type JHS, water and compressed air are mixed externally to produce a round spray which is projected from 10 to 20 feet, depending on the air pressure. Included in the body of the nozzle are two Monel metal strainers—one for the air, the other for the water. The design permits removal of the strainers for cleaning or replacement without disturbing the nozzle or lines. All parts of the nozzle are machined of brass and white coated, and every part is renewable.



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TECHNICAL DEVELOPMENTS

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Removing Hemicelluloses from Wood by Acids

This is a study of the action of specific acids in solutions of approximately the same *p*H (1.04 to 1.16) on beechwood meal under strictly comparable conditions of time and temperature. The acids used were 0.36% HCl, 0.81 HBr, 1.69% oxalic acid, 0.82% sulphuric acid, and 4.8% phosphoric acid. The action was determined by making pentosan detetrminations and also by the yields obtained after hydrolysis. Usually, the greater the molecular volume of the acid, the less is its hydrolytic action within a certain time period. HCl had the greatest, and phosphoric acid the least action on the hemicelluloses of the wood. HBr seems to be out of line because it appears to have less hydrolytic action than oxalic although its molecular volume is lower. This discrepancy may only be an apparent one, inasmuch as the pentosan determinations in the hydrolyzates from HBr may not be accurate. This acid evidently converts pentoses very rapidly into furfural.

Although sulphuric and phosphoric acids have the same molecular volume, the former is more active than the latter. The lower mobility of the H_2PO_4 ion may account for this difference in behavior. Prehydrolysis with HCl gave the lowest "pulp" yield and phosphoric acid gave the highest when sulphate pulps were made from the acid-treated wood. T. Ploetz. Papier-Fabr. 41, 17-8 (1943).

The Effect of Stepwise Beating on Pulp Strength

The effects of continuous beating with interrupted, stepwise beating were studied in the case of bleached and unbleached sulphite and unbleached soda pulps. When these pulps were introduced into a laboratory "Jokro mill," and the beating continued (or interrupted) until 83 deg. S.R. was attained, the pulps showed no noticeable differences in strength properties. Nor did the overall beating time required to reach this deg. S.R. vary in the two series. A similar result was obtained when an experimental laboratory beater was used. However, this was not the case when the beating was carried out in a jordan of semicommercial size, provided in the initial stages the pressure was relatively mild, and was increased gradually in the later stages. Under such conditions, an unbleached sulphite pulp showed marked improvement in strength properties, such as folding endurance, tear, stretch, and breaking length. No such sharp improvement was noted, however, when the beating was drastic in the earlier stages. The experiments indicate that in the jordan used, stepwise beating under specified conditions may lead to enhanced pulp quality. W. Brecht and U. Strindlund. Wochbl. Papierfabr. 73, 321-5 (1942).

Lateral Shrinkage on Drying Paper

The contraction of paper in the cross direction, on drying, depends upon the following factors: water content, composition, degree of beating, the weight, the thickness, and also on the tension under which the sheet was placed. When other factors remain the same, this lateral shrinkage is inversely proportional to the water content and directly proportional to the width of the paper machine. With free stock it is less than with slow stock. In the case of the papers of the U.S.S.R. that were examined, only one showed a lateral contraction of over 6.5%. In general, in the case of most news, book, writing, wrapping, notebook, and similar papers, this shrinkage was actually less than 2%. In the case of parchment, tracing, and heavy papers, it was 2-3.5%. Map papers, and those used in photography, cable, and fine writings and in very high grade book papers, the shrinkage was 3.5-6.5%. D. M. Fliate. Bumazhnaya Prom. 19, No. 4, 37-42 (1941) through Chem. Zentr. 1942, I, 2607.

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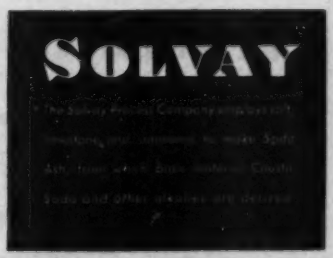

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PAPERMAKING PATENTS

IN THE UNITED STATES — Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Process of Coating Web Material

Patent No. 2,293,690. Herman R. Harrigan, Chevy Chase, Md., assignor to District of Columbia Paper Mills, Inc., Washington, D. C., a corporation of Virginia. Application October 25, 1939. Serial No. 301,280. 3 Claims. (Cl. 117—111). The method of coating a web of paper which comprises flowing an excess of a highly viscous aqueous coating composition having considerably in excess of 33% solids content onto a rotating surface having regularly arranged and uniformly sized pits over an area thereof at least the width of the web of paper to be coated, doctoring away the excess of said coating composition to leave substantially equal volumes of said composition in said pits, rotating said pitted surface into contact with a non-absorbent resilient surface to transfer thereto the coating composition from said pits, the viscosity and other characteristics of said coating composition being such that said coating composition is deposited from said pits on said resilient surface as mounds that tend to coalesce and level off into a film of substantially uniform thickness over said resilient surface, allowing the mounds to coalesce on the resilient surface, bringing the web to be coated into contact with said film formed on said resilient surface, subjecting the portion of said web in contact with said film to rolling pressure to cause said film to uniformly and continuously coat said web surface and to cause the solids content of said film to be pressed onto and compacted with the surface fibers of said web to be made an integral part thereof, and drying the thus coated web.

Method of Making Paper of Improved Wet Strength

Patent No. 2,309,089. Jordan V. Bauer, Elmwood Park, and Don M. Hawley, Geneva, Ill., assignors to Stein, Hall Manufacturing Company, Chicago, Ill., a corporation of Delaware. Application October 6, 1938. Serial No. 233,556. 7 Claims. (Cl. 92—40). A method of producing paper having improved wet strength on a paper making machine which comprises adding a urea and an aldehyde in water-soluble form to the paper while the paper is in a wet condition on the paper machine at some stage of the paper making process prior to final drying of the paper, and then separately adding to the dried paper containing said added urea and aldehyde an acidic solution, said acidic solution being added at a point in the paper making process when the paper is no longer to be subjected to heat, the co-action between the urea and aldehyde and the acidic solution so added to the paper causing an increase in wet strength without substantially destroying its flexibility.

Paper Drier Temperature Control

Patent No. 2,309,565. Adam E. Armstrong, Three Rivers, Mich., assignor to Armstrong Machine Works, Three Rivers, Mich., a corporation of Michigan. Application August 19, 1940. Serial No. 353,269. 12 Claims. (Cl. 34—41). The method of controlling the temperature of a steam heated heat exchange element, comprising supplying steam at constant pressure to the element, continually adding a small amount of air at constant pressure to the steam in the element, intermittently venting steam and air from the element in accordance with the percentage of air in the steam-air mixture in the element, separating and discharging condensate from the steam and air in the element, and controlling the supply of steam to the element in accordance with the pressure therein, said pressure being governed by said intermittent venting and by the amount of condensation occurring in operation of the element.

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New Catalogues, Publications and Association Reports

American Forest Products Industries, Washington, D. C. A new booklet entitled "Tools for the Improvement of Forest Industry Public Relations" has been announced by this organization. This publication not only gives suggestions applicable to forestry campaigns, but it features all of the "tools" that are available for such campaigns. The tools consist of printed display matter and information regarding motion pictures.

American Foundry Equipment Co., Mishawaka, Indiana. A new bulletin, "Dust — The Silent Saboteur of Production" has recently been released. It contains many interesting diagrams and pictures illustrating three types of Dustube dust collectors.

American-Marietta Co., Chicago 11, Illinois. The new Valdura Heavy Duty Maintenance Paint Catalogue tells about protection, durability and technical data of Valdura Improved Asphalt Paint, Valdura Machinery and Floor Enamel, Valdura Metal Lead, Valdura Singlekote, Valdura Millwhite, Porcelain-Like Valdura Dairywhite Enamel, Asgum and Roofdura. It is interestingly prepared and includes many pictures describing all the above mentioned items.

Armstrong Machine Works, Three Rivers, Mich.— An illustrated booklet presenting engineering data and complete details on unit steam-type humidifiers is now available from this company. The booklet shows results obtained by automatic humidification for prevention of loss of weight, strength, or quality in hygroscopic materials; for improving workability of materials; for controlling drying processes; for static control to prevent explosion hazard with dust and inflammable liquids and gases; and air conditioning service.

Beaver Pipe Tools, Warren, Ohio, has recently published Catalogue No. 44. This catalogue gives broader coverage to the Beaver Line than in previous catalogues and more clearly dissects Beaver Tools and Machines for the benefit of the buyer. It also gives a number of downward price changes which have been made, all of which price changes conform to the OPA Price Regulation. Copies may be obtained from the company. Also available for distribution are copies of condensed catalogue which has recently been printed.

Bristol Company, Waterbury 91, Conn., has available for distribution an attractive broadside containing pictures and diagrams of its various automatic control and recording instruments. It also contains a list of basic instruments (not illustrated) offered by the company and tells many details about the company, together with a map of the United States and Canada shewing the various factories, branch offices and field resident engineers of the Bristol Company. Attached to the broadside is a postal card to be used for asking for literature on any of the various instruments manufactured by the company.

Flexrock Company, Philadelphia 4, Pennsylvania, has issued a new folder which will be very helpful to men responsible for plant maintenance by giving many suggestions. This folder contains descriptive information of the many products manufactured by the company together with illustrations.

Formed Steel Tube Institute, Cleveland, Ohio. This company has prepared a chart showing the symbols of all companies who manufacture welded steel tubing for heat transfer apparatus and who are reported as having adopted this identification procedure. Copies of the chart "Identification of Welded Heat Exchanger and Condenser Tubing" are available from the company.

Hercules Powder Co., Wilmington, Delaware—A booklet prepared by this company for war producers is entitled "Staybelite Esters." The booklet contains data on physical properties and lists typical materials compatible with Staybelite esters. Important data tables are included.

International Acetylene Association, New York 17, New York, has prepared a 16-page pocket-size booklet entitled "Preventing Welding and Cutting Fires." The booklet is clearly written and contains brief discussions of the chief causes of fires and practical measures for preventing them. Copies may be obtained, without cost, from the company or from any manufacturer of oxygen, acetylene, carbide or welding and cutting equipment.

Northern Engineering Works, Detroit, Michigan. A new folder entitled "The New Northern Travelator" is being distributed through Witte & Burden, 5757 Cass Avenue, Detroit 2, Michigan. This folder is well-illustrated and gives a brief account of the development and method of application of the "Travelator."

Oakite Products, Inc., New York, New York, has recently issued a third revised edition of a 28-page manual which gives successful methods and techniques for handling cleaning, de-scaling and related tasks on a wide range of paper mill equipment. Copies of this manual are free upon request.

Philadelphia Quartz Company, Philadelphia 6, Pennsylvania, announces its new placard on the proper care of drums prepared for its customers who buy silicate in such packages. This placard is printed in two colors in large, easy-to-

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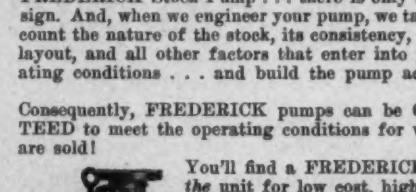

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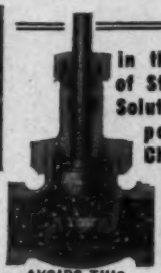

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Preferred Utilities Co., Inc., 1860 Broadway, New York 23, N. Y.—Available from this company is a timely bulletin showing how, by the installation of a simplified, automatic draft control device, savings of 10 per cent to 30 per cent may be effected in the fuel consumption of natural draft boilers. This device is called the Draft-A-Justor. The bulletin also includes a graph showing the relation between CO_2 and preventable fuel losses; a tabulation of essential requirements for a successful draft regulator and a table of ratings.

Sun Oil Company, Philadelphia, Pa.—A booklet which asks the question in its title "What Makes a Grease"? Has been distributed by this company. Answers to some of the grease problems are given in this booklet which is illustrated. Address Dept. 63.

Reeves Pulley Company, Columbus, Indiana, has a new catalogue G-435 which is a very attractive catalogue with a dark brown fiberboard cover, embossed in gold, in an ivory plastic binder. It completely describes all REEVES Variable Speed Control Units,—The Transmission, The Vari-Speed Motor Pulley and the Motodrive. Complete details are given on recent additions and improvements to the REEVES products, also information is given on new automatic controls and on the REEVES Speedial Handwheel.

Stephens-Adamson Mfg. Co., Aurora, Illinois. This company has a new product now available which is thoroughly described in its new "Saco" Speed Reducer Catalogue No. 643. This new 8-page Catalogue contains the latest and most complete information on the SACO Speed Reducer.

Association Reports

Following are major reports sent out by the American Paper and Pulp Association during the month of October. Any correspondence with that office regarding these releases should carry identifying titles and numbers as listed.

Federal Regulations

Prices No. 18—Revised Maximum Price Regulation No. 187.

Paper Production No. 19 and No. 20—M-241 amended October 16, 1943 and L-241 amended October 21, 1943 (respectively). No. 21 includes form WPB 3270 Paper or Paperboard: Schedule of orders under production reserve of M-241.

Materials and Supplies No. 40 and No. 42—Priorities Regulation 16 (Amended), and Report of Combined Pulp and Paper Committee.

Labor Relations

General No. 8—Wartime executive orders affecting manpower. Chart of wartime executive orders affecting labor.

Books

The Foreman's Handbook—Written by eighteen specialists, one chapter by each contributor, this volume has been written solely for foremen. "Its major purpose," according to Carl Heyel of the Union Bag and Paper Corporation, one of the book's contributors as well as its editor, "is to help the foreman develop his job beyond the point at which he assumed it — to help him grow." Each chapter is complete in itself, independent of preceding or succeeding chapters.

The work discusses the day-to-day responsibilities of foremen in handling people and in supervising production. It also presents background information on economic, legislative and management fundamentals. The volume totals 410 pages. It is priced at $3.00 a copy. The publisher is the McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York, New York.

Cellulose and Cellulose Derivatives—Prepared by a staff of specialists under the editorship of Emil Ott, Director of Research, Hercules Powder Company, this monograph is divided conveniently into ten chapters: namely, Occurrence of Cellulose, Chemical Nature of Cellulose and its Derivatives, Structure and Properties of Cellulose Fibers, Carbohydrates Normally Associated with Cellulose in Nature, Lignin and Other Noncarbohydrates, Preparation of Cellulose from Its Natural Sources, Bleaching and Purification of Cellulose, Derivatives of Cellulose, Physical Properties of Cellulose and Its Derivatives and Technical Applications of the Physical Properties of Cellulose and Its Derivatives. It is a volume of nearly 1200 pages attractively and durably bound in a stiff, blue cloth cover. In addition to Dr. Ott, the staff of contributors totaled 35.

According to Dr. Ott, in his preface to the volume, about four-fifths of the material in the book was contributed by persons engaged in industry or working in institutions supported by industry or in government laboratories. Many of the contributors are well-known to the pulp and paper industry because of other contributions by them to the literature of pulp and paper making. An extensive author index as well as subject index makes the volume very usable for reference. Published by Interscience Publishers, Inc., 215 Fourth Avenue, New York, New York, the book is priced at $15.00 a copy.

Salvage Manual for Industry—This is a comprehensive practical manual on industrial salvage just published by the Technical Service Section, Industrial Salvage Branch of the WPB. Edited by 7 engineers, paper-bound, 6 in. x 9 in., 250 pages. Price 50 cents per copy, procurable through the Superintendent of Documents, Government Printing Office, Washington, D. C.

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS — *per cwt.*

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Heedings	-7.25
White Shrunk	-5.00
Silesias No. 1	-5.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-5.00
White	-14.00
Grey	-14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS — *per cwt.*

New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes — Nominal
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)

ex dock New York City

OLD RAGS — *per cwt.*

No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints
Ord. Light Prints — Nominal
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shoppers

ROPE and BAGGING

f. o. b. and ex dock New York City

Gunny No. 1—	*per cwt.*
Foreign	Nominal
Domestic	3.00 to 3.25
Wool Tares—	*per cwt.*
Light	3.25 to 3.50
Heavy	3.50 to 3.75
No. 1 Scrap Bagging	2.75 to 3.00
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*85.00
New Burlap Cuttings	5.50 to 5.75
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft Jute	5.00 to 5.25
Mixed	1.50 to 1.75

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment, with brokers' allowance of 4 to 9 per cent.

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, Unruled	57.50-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
Repacked No. 1 Heavy Books and Magazines	23.50-
Mixed Books	17.00-
Ledger Stock—	
No. 1 White	43 50-
No. 1 Mixed (Colored)	37.50-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	37.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissue	17.00-
No. 1 Baled	15.00-
Old Corrugated Containers	23.00
New Corrugated Cuts	18.00-
Mill Wrappers	17.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	14.00-

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
30-30 mesh (bags), lb.	24.00 to 24.75
80-100 mesh (bags), lb.	—
Argentine, lb.	—
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	12.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.50
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	4.00-
F	4.01-
G	4.02-
WW	6.17-
Rosin (Wood), carlots	3.64-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 25 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.20-
Paper (8p.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	5.60 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo.:

Bleached softwood sulphite	78.00
Unbleached softwood sulphite	66.00
Bleached hardwood sulphite	73.50
Unbleached hardwood sulphite	63.50
Bleached Mitscherlich sulphite	81.00
Unbleached Mitscherlich sulphite	72.00
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Standard news print siderune	46.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda pulp	66.00
Unbleached soda pulp	62.00
Ground wood pulp	46.00
Sulphite screenings	38.50
Sulphate screenings	38.00
Ground wood screenings	30.00
Northern unbleached sulphate siderune	73.00
Southern unbleached sulphate siderune	63.50

PAPER

f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	45.00-
Chip, sgl. mla. lined	60.00-
Coated, white patent	
.016	80.00-
.020 and heavier	75.00-
Kraft liner	63.00-
News	48.00-

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)	
Book, White (M. F.)—	
A Grade E. F.	8.25
B Grade E. F.	7.80
C Grade E. F.	7.55
D Grade E. F.	7.30
E Grade E. F.	7.05
No. 2 Uncoated Offset 4 sides. White	8.45
Coated White (Trimmed 4 sides)	
No. 1 Glossy	11.90
No. 2 Glossy	10.85
No. 3 Glossy	10.15
No. 4 Glossy	9.80
No. 5 Glossy	9.30
C2S Offset	10.40
C1S Litho (Varnish)	10.05
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with sizes, quantity, packing and other differentials allowed:

Rag Content Bond—	*per cwt.* 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

Rag Content Ledger—	*per cwt.* Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.00
75% Rag	21.00
50% Rag	17.00
25% Rag	15.00

Sulphite Bond—	*per cwt.* 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M. F.) watermarked	9.00	9.70
No. 2 (M. F.) watermarked	8.25	8.85
Plain (M. F.) unwatermarked	7.60	8.30

Sulphite Ledger—	*per cwt.* Zone 1
No 1 (M. F.) watermarked	10.00
No. 2 (M. F.) watermarked	9.25
Plain (M. F.) unwatermarked	9.00

Glassine (f. o. b. mill)—	*per cwt.*
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50

News—OPA Ceilings	*per ton*
Rolls (Contract)	58.00
Rolls (Spot)	(nominal)
Sheets	60.00

Tissues (Carlots)—	*per ream*
White, No. 1	1.12½ to 1.30
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.60-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.60-
Toilet, Bleached (M shts.) per cs.	5.65-
Toilet, Unbleached (M shts.) per cs.	4.25-

Towels—	*per case*
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05

Wrappings (Kraft)—	*per cwt.*
Super-Standard	5.25-
No. 1 Wrapping	5.00-
Standard Wrapping	4.75-
Standard Bag	4.37½-

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)

Bleached papers—	*per cwt.*
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.50
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd remarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-20 lb.	6.75 to 7.00

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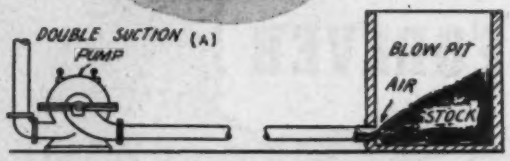
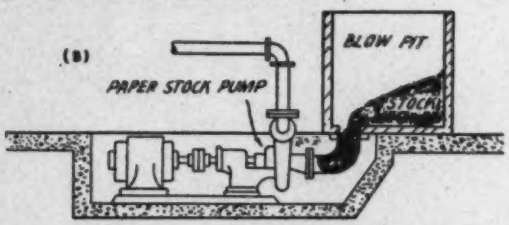
GOULDS PUMPS SOLVE A PAPER STOCK PUMPING PROBLEM

This original installation shows a double suction pump on blow pit service incorporating a long horizontal run of suction pipe, with the pump located 30 ft. from the chest.



The outlet from the chest and pump were approximately at the same level, leaving little or no submergence when the stock level was low in the chest. When the pumping operation reached this point, air was drawn into the suction pipe and, collecting in the top of the suction pipe and pump casing, effectively air bound the pump. When this condition occurred, it was necessary to direct a large stream of water into the chest and raise its level to again permit the pump to operate.



This shows the method by which the trouble was corrected. A regular side suction type of paper stock pump was used, located in a pit below the bottom of the chest with a short and direct suction elbow from chest to pump. This paper stock pump was of the top horizontal discharge type and when this change was made the pump performed entirely satisfactorily and would pump the chest clear down to the bottom. Any air entering the suction pipe at low chest levels was easily discharged from the pump through the self-venting top horizontal discharge nozzle.

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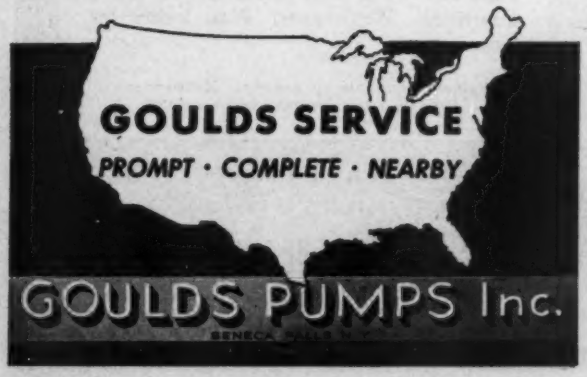

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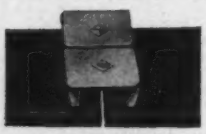

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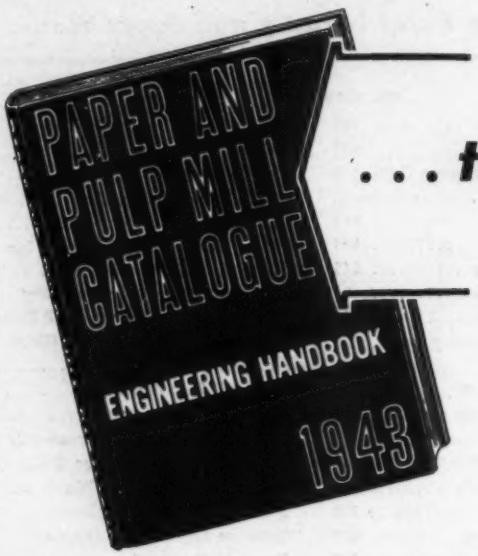

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Infilco Incorporated.
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Jeffrey Manufacturing Company, The.
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Johnson Corporation, The.
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Jones Foundry & Machine Company, W. A.
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Lawrence Machine & Pump Corporation.
Leader Iron Works, Inc.
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Mason-Neilan Regulator Company.
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Swenson Evaporator Company.
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Taylor Forge & Pipe Works.
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Toledo Scale Company.
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Twin Disc Clutch Company.
Union Machine Company.
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Valley Iron Works Company.
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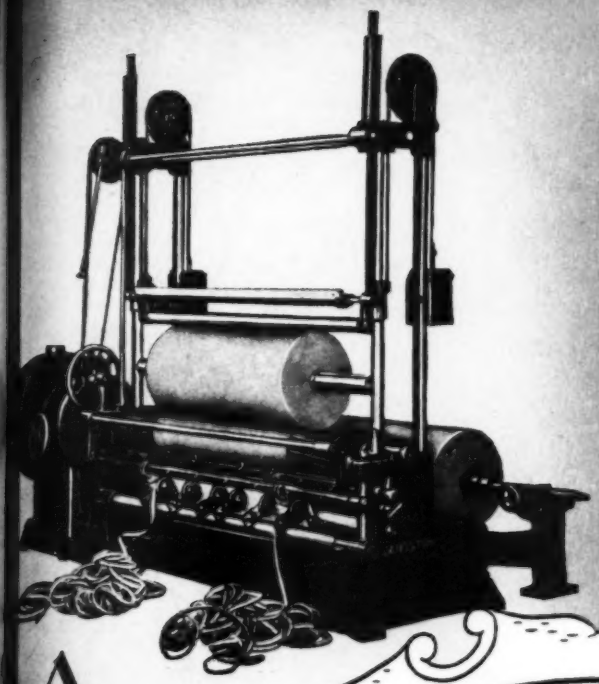

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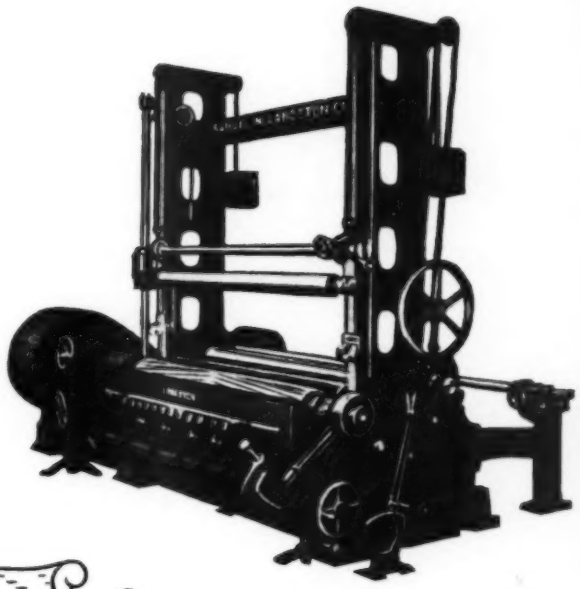

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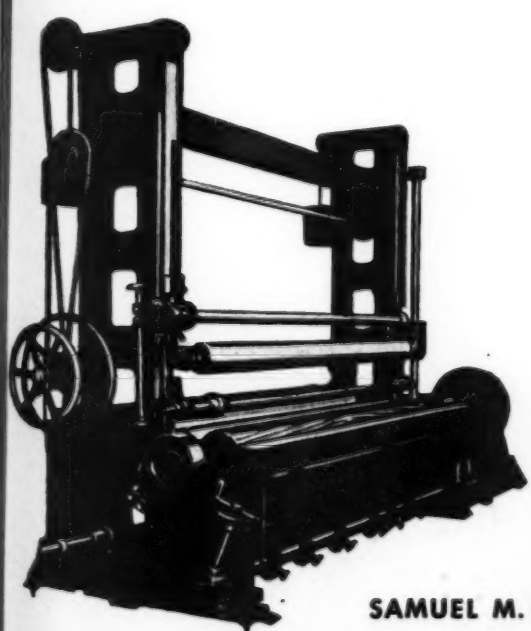

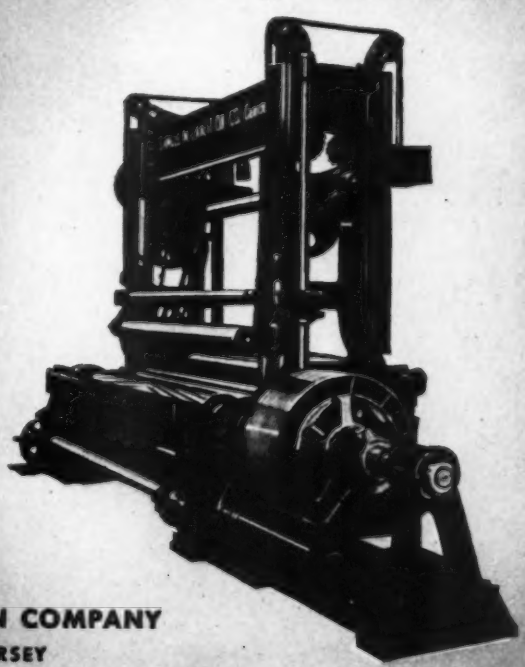

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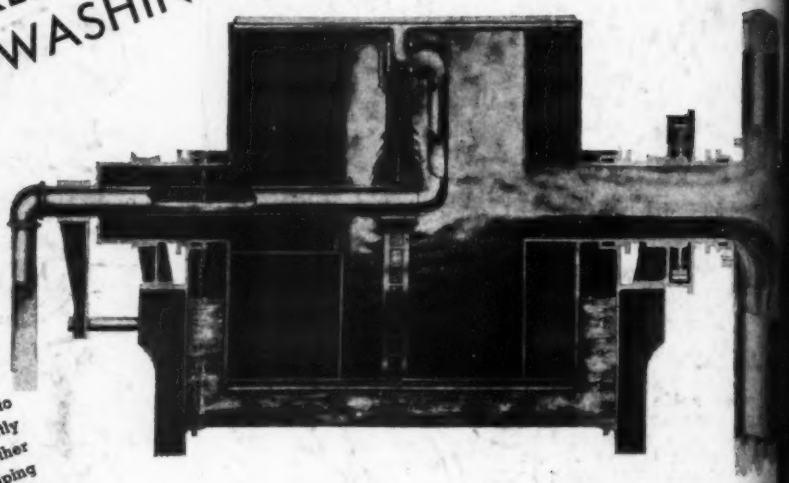
LEADING IN DECKERING CAPACITY
LEADING IN B. L. WASHING EFFICIENCY



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